DOCUMENT RESUME

ED 397 278 CE 072 163

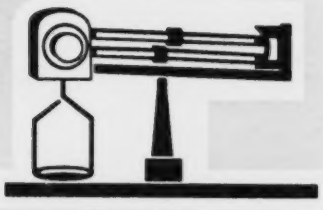
TITLE	Mississippi Curriculum Framework for Agriscience (Program CIP: 02.0101--Agriculture Science). Secondary Programs.
INSTITUTION	Mississippi Research and Curriculum Unit for Vocational and Technical Education, State College.
SPONS AGENCY	Mississippi State Dept. of Education, Jackson. Office of Vocational and Technical Education.
PUB DATE	1 Aug 95
NOTE	136p.; For related documents, see CE 072 162-231.
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	Academic Education; *Agricultural Education; *Agricultural Engineering; *Agriculture; *Agronomy; Animal Husbandry; Behavioral Objectives; Biotechnology; Classroom Techniques; Communication Skills; Competence; *Competency Based Education; Core Curriculum; Educational Equipment; Employment Qualifications; Entomology; Environmental Education; Leadership; Natural Resources; Secondary Education; Soil Science; State Curriculum Guides; Statewide Planning; Student Evaluation; Supervised Occupational Experience (Agriculture); Vocational Education
IDENTIFIERS	*Agricultural Sciences; Future Farmers of America; Mississippi

ABSTRACT

This document, which reflects Mississippi's statutory requirement that instructional programs be based on core curricula and performance-based assessment, contains outlines of the instructional units required in local instructional management plans and daily lesson plans for agriscience I and II. Presented first are a program description and course outlines. Section I contains curriculum frameworks for both courses, and section II contains outlines of the instructional units required in each course. Units in Agriscience I are: introduction, application of the scientific method, human relations/leadership/Future Farmers of America activities, developing a supervised agricultural experience (SAE) program, agricultural information systems, animal science, mechanical science, principles of fiber science, plant science, soil science, natural resources, entomology, biotechnology, and opportunities in agriscience. Units in agriscience II are communication skills, SAE in agriscience, advanced biotechnology, food science, advanced plant science, advanced soil science, environmental science, aquaculture, and advanced animal science. Each unit includes suggested time on tasks, competencies and objectives, teaching strategies, assessment strategies, and resources. Recommended tools and equipment are listed in section III. Appended are lists of related academic topics and workplace skills for the 21st century and student competency profiles for both courses. (YLB)

Mississippi Curriculum Framework for Agriscience

ED 397 278



U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

R Lee Walker

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Secondary
Vocational and Technical Education
1995

BEST COPY AVAILABLE

August 1, 1995

MISSISSIPPI

CURRICULUM FRAMEWORK

FOR

AGRISCIENCE

(PROGRAM CIP: 02.0101 - AGRICULTURE SCIENCE)

SECONDARY PROGRAMS 1995

August 1, 1995

Direct inquiries to:

Program Coordinator
Agriculture and Related Technology
Office of Vocational and Technical Education
P.O. Box 771
Jackson, Mississippi 39205
(601) 359-3475

For copies of this publication, contact:

Research and Curriculum Unit
P.O. Drawer DX
Mississippi State, MS 39762
(601) 325-2510

Published by the:

Office of Vocational and Technical Education
Mississippi Department of Education
Jackson, Mississippi

Research and Curriculum Unit for Vocational and Technical Education
College of Education
Mississippi State University
Mississippi State, Mississippi

1995

Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, age, handicap/disability, or veteran status.

FOREWORD

The curriculum framework in this document reflects the work of teachers, state and local administrators, and representatives of business, industry, and service occupations to enhance the content of vocational-technical courses in Mississippi public schools. Revision of the curriculum was begun by a team of teachers from the program area. The resulting draft was submitted to local administrators for review and comments, and to a Standing Technical Committee composed of employers and employees in the occupational area(s) of the curriculum. Comments and recommendations from these reviews were presented to the revision team for discussion and action. An executive summary of this document, containing the program and course descriptions and competencies and suggested objectives for each course, was presented to the Mississippi Board of Education for formal approval and adoption.

The intent of this document is to provide local school district personnel with a framework which can be used to develop local instructional management plans and lesson plans for teaching vocational-technical courses. The contents of this framework are not intended to limit the selection of the actual competencies and objectives in the course, but instead to provide a minimum baseline which all schools must meet. Teachers and curriculum development personnel are encouraged to expand and enhance this framework to meet the needs of their students.

The courses in this document reflect the following statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended:

> The State Department of Education shall provide an instructional program and establish guidelines and procedures for managing such programs in the public schools as part of the State Program of Educational Accountability and Assessment of Performance. . .
>
> The department shall provide that such program or guidelines . . . are enforced through the performance-based accreditation system.
>
> The local school board must adopt the objectives that will form the core curriculum that will be systematically delivered throughout the district.
>
> Standards for student performance must be established for each core objective in the local program and those standards establish the district's definition of mastery for each objective.
>
> There shall be an annual review of student performance in the instructional program against locally established standards.

Each secondary vocational-technical course consists of a series of instructional units which focus on a common theme. All units have been written using a common format which includes the following components:

- Unit Number and Title
- Suggested Time on Task - The number of days of instruction that should be required to teach the competencies and objectives of the unit. For secondary occupational programs, a "day" represents a two-period block of instruction.
- Competencies and Suggested Objectives
  - A **Competency** represents a general concept of performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to master all competencies in the curriculum framework in order to satisfactorily complete the course.
  - The **Suggested Objectives** represent the enabling and supporting knowledge and performances that will indicate mastery of the competency.
- Suggested Teaching Strategies - This section of each unit indicates strategies that can be used to enable students to master each suggested objective. Teachers should feel free to modify or enhance these suggestions based on needs of their students and resources available in order to provide optimum learning experiences for their students.
- Suggested Assessment Strategies - This section indicates strategies that can be used to measure student mastery. Examples of suggested strategies could include classroom discussions, laboratory exercises, and student assignments. Again, teachers should feel free to modify or enhance these suggested assessment strategies based on local needs and resources.
- Suggested Resources - This section indicates some of the primary instructional resources that may be used to teach the competencies and suggested objectives. Again, these resources are suggested and the list may be modified or enhanced based on needs and abilities of students and on available resources.

The following guidelines were used in developing the curriculum framework in this document and should be considered in developing local instructional management plans and daily lesson plans:

- The content of the courses in this document reflects approximately 75 percent of the time allocated to each course. For a one-year course, this means that the content of the existing units of instruction should represent approximately 135 days of instruction. The remaining 25 percent of each course should be developed at the local district level and may reflect:
  - Additional units of instruction within the course related to topics not found in the state framework.
  - Activities which develop a higher level of mastery on the existing competencies and suggested objectives.
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed/revised.
  - Activities which implement components of the Mississippi Tech Prep Initiative, including integration of academic and vocational-technical skills and coursework, school-to-work transition activities, and articulation of secondary and postsecondary vocational-technical programs.
  - Individualized learning activities, including work site learning activities, to better prepare individuals in the courses for their chosen occupational area.
- Sequencing of the units of instruction within a course is left to the discretion of the local district. Naturally, foundation units related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other units related to specific skill areas in the course, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.

ACKNOWLEDGEMENTS

Writing Team

Donald Downs, North Panola High School, Sardis
Bobby Kelly, Franklin County Vocational Center, Meadville
Leroy Kelly, Enterprise High School, Enterprise
Jeff McKinney, Nettleton High School, Nettleton

RCU Staff

Vanik S. Eaddy, Ph. D., Research and Curriculum Specialist

OVTE Staff

Bill McGrew, Program Coordinator, Agricultural and Related Technology
Tom Maxwell, Assistant Program Coordinator, Agricultural and Related Technology

Resource Persons

Powhatten Fluker, Ed. D., Alcorn State University
Michael Newman, Ph. D., Mississippi State University

Reviewers

Jeff McKey
Al Bourgeois
Glen Brousssard
Keith Culpepper
Donald C. Jones
Rich A. Vaughn
James Malone
Tom Clark
Paul Nolan
Richard A. Hartley
Ray Renolds
Gayle H. Tumcy

Technical Committee Members

Windell Carter
Jackie Courson
W. B. Jones
Donald Robohm
George Brunt
Ralph Kahlor
Bill Brand
David A. Smith
W. D. Craft
Ruby Rankin
Ray Reynold
Cornell M. Ladner
Glenmore C. Powell

TABLE OF CONTENTS

Page

FOREWORD iii

ACKNOWLEDGEMENTS vii

PROGRAM DESCRIPTION 1

COURSE OUTLINE 2

SECTION I: CURRICULUM FRAMEWORK FOR AGRISCIENCE 3

Agriscience I 5
Agriscience II 21

SECTION II: CURRICULUM GUIDE FOR AGRISCIENCE 33

Agriscience I 35
Unit 1: Introduction to Agriscience 37
Unit 2: Application of the Scientific Method in Agriscience 39
Unit 3: Human Relations/Leadership/FFA Activities 41
Unit 4: Developing a Supervised Agricultural Experience Program (SAE) in Agriscience 45
Unit 5: Agricultural Information Systems 48
Unit 6: Animal Science 49
Unit 7: Mechanical Science 54
Unit 8: Principles of Fiber Science 57
Unit 9: Plant Science 60
Unit 10: Soil Science 64
Unit 11: Natural Resources 67
Unit 12: Entomology 71
Unit 13: Biotechnology 74
Unit 14: Opportunities in Agriscience 76

Agriscience II 79
Unit 1: Communication Skills 81
Unit 2: Supervised Agricultural Experience (SAE) in Agriscience 84
Unit 3: Advanced Biotechnology 86
Unit 4: Food Science 90
Unit 5: Advanced Plant Science 93
Unit 6: Advanced Soil Science 96
Unit 7: Environmental Science 99

Unit 8: Aquaculture 105
Unit 9: Advanced Animal Science 108

SECTION III: RECOMMENDED TOOLS AND EQUIPMENT FOR AGRISCIENCE 111

APPENDIX A: RELATED ACADEMIC TOPICS A-1

APPENDIX B: WORKPLACE SKILLS B-1

APPENDIX C: STUDENT COMPETENCY PROFILE C-1

Agriscience I C-3
Agriscience II C-7

August 1, 1995

PROGRAM DESCRIPTION

AGRISCIENCE

(Program CIP: 02.0101 - Agriculture Science)

Agriscience provides a study of selected areas of agricultural science. Students will investigate agricultural science topics ranging from computers to genetics. These concepts are taught through classroom and laboratory instruction and applications such as the Supervised Agricultural Experience Program (SAE) and FFA Contests and Proficiency Awards Programs. This program will utilize the problem solving method of instruction and will rely upon the Agricultural Satellite Information System (ASIS). Leadership, citizenship, and cooperation skills are taught through participation in FFA activities. The FFA is an intra-curricular vocational student organization designed to provide a learning laboratory for the implementation of this curriculum. Graduates may be employed at the entry level or pursue careers through Agriculture, Agribusiness, or Natural Resources Education in postsecondary or higher education.

COURSE OUTLINE

AGRISCIENCE I

Unit No.	Unit Title	No. of Days
Unit 1	Introduction to Agriscience	5
Unit 2	Application of the Scientific Method in Agriscience	5
Unit 3	Human Relations/Leadership in Agriscience	15
Unit 4	Supervised Agricultural Experience (SAE) in Agriscience	10
Unit 5	Agricultural Information Systems	15
Unit 6	Animal Science	10
Unit 7	Mechanical Science	10
Unit 8	Principles of Fiber Science	5
Unit 9	Plant Science	10
Unit 10	Soil Science	10
Unit 11	Natural Resources	10
Unit 12	Principles of Entomology	10
Unit 13	Biotechnology	10
Unit 14	Opportunities in Agriscience	10

AGRISCIENCE II

Unit No.	Unit Title	No. of Days
Unit 1	Communication Skills	10
Unit 2	Supervised Agricultural Experience (SAE) in Agriscience	15
Unit 3	Advanced Biotechnology	25
Unit 4	Food Science	14
Unit 5	Advanced Plant Science	15
Unit 6	Advanced Soil Science	15
Unit 7	Environmental Science	13
Unit 8	Aquaculture	14
Unit 9	Advanced Animal Science	14

12

SECTION I:

CURRICULUM FRAMEWORK

FOR

AGRISCIENCE

CURRICULUM FRAMEWORK

Course Name: Agriscience I

Course CIP Code: 02.9991

Course Description: Agriscience I is the entry level course of the secondary Agriscience program where the Introduction to Agriscience course is not offered. Students in Agriscience I will gain foundation competencies related to careers in Agriscience, application of the scientific method in agriscience, human relations/leadership/FFA activities, developing a supervised agricultural experience program in agriscience, agricultural information systems, animal science, mechanical science, principles of fiber science, plant science, soil science, natural resources, entomology, biotechnology, and opportunities in agriscience. (2-2½ Carnegie units, depending upon time spent in the course)

Competencies and Suggested Objectives:

1. Describe vocational student organization activities that relate to and support the instructional program.
   a. Identify vocational student organization activities supporting the instructional program.
   b. Determine what procedures are needed to participate in vocational student organization activities.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
2. Compile information on careers in agriscience.
   a. Identify career opportunities in agriscience.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
3. Apply leadership skills needed in agriscience.
   a. Demonstrate leadership skills in speaking.
   b. Demonstrate leadership skills in conducting a meeting using "Roberts Rules of Order."

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6

4. Identify a problem to be solved.
   a. Describe the identified problem and how the scientific method can be used to solve it.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

5. Apply the scientific method in problem solving.
   a. Identify the problem or question to be answered.
   b. Gather data related to the problem or question.
   c. Formulate possible solutions.
   d. Implement one or a combination of solutions.
   e. Evaluate the results and pursue further research as needed.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

6. Explain FFA organizational activities that promote and recognize achievements in agriscience.
   a. Describe contests and awards programs.
   b. Participate in personal development seminars.
   c. Attend leadership activities, conferences, and/or conventions.
   d. Explain national and international exchange programs.
   e. Plan for educational experience with industry.
   f. Determine opportunities for participation in personal and community development programs.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6

7. Identify the benefits of FFA participation to an individual and to the agricultural industry.
   a. Describe personal growth and development opportunities through participation in activity programs of the agricultural industry.
   b. Explain benefits of exposure to the agricultural industry environment and multicultural experiences.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6

8. Explain opportunities for members in the FFA organization.
   a. Identify opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6
9. Develop and present a 3-5 minute speech on an agricultural topic.
   a. Utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6
10. Explain the purposes and functions of parliamentary procedure.
   a. Conduct a meeting.
   b. Describe different methods of voting and handling of motions.
   c. Assume officer positions and describe their functions.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6
11. Describe the purposes and requirements of the SAE.
   a. Establish objectives for the SAE.
   b. Determine the availability of time and money to invest.
   c. Select a system of record keeping.
   d. Determine benefits of participation in the SAE.
   e. Determine types of SAE programs.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
12. Develop a long-range personal plan for the SAE.
   a. Set long-range goals.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
13. Develop a short-range personal plan.
   a. Set short-range goals.

Related Academic Topics (See Appendix A):
C1, C2, C4, C5, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

14. Complete a training agreement for the SAE.
    a. Establish requirements of student, parents, supervisor, and/or employer.

Related Academic Topics (See Appendix A):
C1, C2, C4, C5, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP3, WP6

15. Describe agricultural record keeping for the SAE.
    a. Determine which records to keep, why, and how to maintain each system.

Related Academic Topics (See Appendix A):
C1, C2, C4, C5, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

16. Maintain agricultural records for the SAE.
    a. Prepare income and expense records.
    b. Prepare inventory records.
    c. Compute enterprise summaries.
    d. Maintain placement records.
    e. Summarize the SAE program.
    f. Maintain leadership activity records.
    g. Compute a net worth statement.

Related Academic Topics (See Appendix A):
C1, C2, C4, C5, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

17. Produce information for use by others and make it available on the Internet.
    a. Develop ASCII text documents containing student generated information related to agriscience.
    b. Author files using hypertext markup language (HTML)
    c. Create/maintain Home Pages on the World Wide Web.

Related Academic Topics (See Appendix A):
C1, C2, C4, C5, C6
Workplace Skills (See Appendix B):
WP2, WP3, WP4, WP5, WP6

18. Explain the roles and functions of major body systems.
    a. Describe the roles and functions of major body systems including circulatory, respiratory, muscular, excretory, nervous, skeletal, integument, digestive, urinary, and endocrine.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S1, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

19. Identify major differences in body systems among species.
    a. Compare major differences in body systems among species.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S1, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

20. Explain the nutrients required by animals for normal growth and development.
    a. Describe the purpose of nutrients required by animals for normal growth and development including carbohydrates, fats, proteins, vitamins, minerals, and water.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S1, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

21. Identify nutrient sources and functions for animals.
    a. Describe roughages.
    b. Describe concentrates.
    c. Describe animal byproducts.
    d. Describe minerals.
    e. Describe synthetic nutrients.
    f. Analyze feed samples.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S1, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

22. Develop a ration for a specific species and class of animal.
    a. Balance a ration using the Pearson Square.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M1, M7
S1, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

23. Classify and explain animal diseases.
    a. Describe bacterial diseases.
    b. Describe viral diseases.

c. Describe environmental diseases.
d. Describe parasitic diseases.
e. Collect a blood sample and analyze for parasites and/or disease.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S1, S8

Workplace Skills (See Appendix B):
WP2, WP4, WP6

24. Explain methods of controlling diseases.
    a. Describe sanitation.
    b. Describe isolation.
    c. Describe vaccination.
    d. Demonstrate vaccination procedures.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S1, S8

    Workplace Skills (See Appendix B):
    WP2, WP4, WP6

25. Explain the risks to humans from contagious and non-contagious diseases and parasites.
    a. Describe risks to humans from contagious diseases and parasites.
    b. Describe risks to humans from non-contagious diseases and parasites.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S1, S8

    Workplace Skills (See Appendix B):
    WP2, WP4, WP6

26. Explain procedures to apply for a pest applicator's license.
    a. Apply for a pest applicator's license.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S1, S5, S8

    Workplace Skills (See Appendix B):
    WP2, WP4, WP6

27. Explain Ohm's law.
    a. Solve problems using Ohm's law.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M1, M4, M7
    S6, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP5, WP6

28. Explain magnetism.
    a. Describe the basic principles of magnetism.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M1, M4, M7
    S6, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP5, WP6

29. Measure temperatures using Celsius, Kelvin, and Fahrenheit scales.
    a. Convert temperature between Celsius, Kelvin, and Fahrenheit scales.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M1, M4, M7
    S6, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP5, WP6

30. Explain the operating principles of internal combustion temperatures.
    a. Define piston displacement.
    b. Determine compression ratio of various engines.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M1, M4, M7
    S6, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP5, WP6

31. Explain principles and applications of fluid power machines.
    a. Define hydraulics.
    b. Calculate mechanical advantage.
    c. Demonstrate principles of hydraulics.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M1, M4, M7
    S6, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP5, WP6

32. Use a voltmeter.
    a. Calculate watts, amperes, and volts.
    b. Calculate kilowatt hours.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M1, M4, M7
    S6, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP5, WP6

33. Identify terms related to fiber science.
    a. Define terms related to fiber science.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M7
    S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

34. Explain the fiber industry in relation to clothing, paper, and textiles.
    a. Describe the fiber industry in relation to clothing.
    b. Describe the fiber industry in relation to paper.
    c. Describe the fiber industry in relation to textiles.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M7
    S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

35. Explain the economic importance of fiber.
    a. Describe money generated in the fiber industry.
    b. Describe the need for plant fibers.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M7
    S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

36. Explain the ginning process for cotton.
    a. Describe the ginning process for cotton including fiber and the byproducts of seed, hulls, and oil.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M7
    S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

37. Explain the paper making process.
    a. Describe the paper making process including types of paper and the byproducts produced.
    b. Recycle paper into a usable product.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

38. Explain terms associated with plant science.
    a. Define terms associated with plant science.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S2, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

39. Categorize the classes of agricultural plants.
    a. Classify plants by life cycle.
    b. Identify parts of plants.
    c. Describe functions of plant parts.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S2, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

40. Determine the nutrients needed for proper plant growth.
    a. Identify secondary and primary plant nutrients.
    b. Determine fertilizer types and amounts needed by plants for proper growth.
    c. Analyze the effects of nutrients on plants.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S2, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

41. Describe common plant pests and diseases and control methods.
    a. Identify common plant pests.
    b. Identify common plant diseases.
    c. Determine methods of pest control.
    d. Determine methods of disease control.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S2, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

42. Compare the activities in a plant during exposure to light and darkness.
    a. Describe photosynthesis.

b. Describe the light conversion process.
c. Analyze the effects of nutrients on plants.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S2, S8

Workplace Skills (See Appendix B):
WP2, WP4, WP6

43. Explain the various food storage processes in plants.
    a. Describe food storage in roots.
    b. Describe food storage in stems.
    c. Describe food storage in seeds.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S2, S8

    Workplace Skills (See Appendix B):
    WP2, WP4, WP6
44. Distinguish between sexual and asexual reproduction.
    a. Describe sexual reproduction.
    b. Describe asexual reproduction.
    c. Demonstrate one method each of plant sexual and asexual reproduction.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S2, S8

    Workplace Skills (See Appendix B):
    WP2, WP4, WP6
45. Identify the reproductive parts of flowers and seeds.
    a. Draw the reproductive parts of a flower.
    b. Label the reproductive parts of a seed.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S2, S8

    Workplace Skills (See Appendix B):
    WP2, WP4, WP6
46. Determine soil textures from selected samples.
    a. Identify a clay based soil.
    b. Identify a sand based soil.
    c. Identify a silt based soil.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S4, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
47. Explain factors affecting soil classification. 2.3
    a. Describe slope and drainage.

b. Determine slope and drainage.
c. Describe permeability.
d. Determine permeability.
e. Describe texture.
f. Determine texture.
g. Describe depth of top soil.
h. Determine depth of top soil.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M1, M4, M7
S4, S8

Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

48. Describe methods used in determining soil capability classes.
    a. Apply soil capability classes to soil in local area.
    b. Identify soils in the local area using county soil survey maps.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S4, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
49. Apply procedures for collecting soil samples.
    a. Collect a soil sample.
    b. Analyze a soil sample for primary nutrients and pH.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S4, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
50. Explain the importance of forestry in relation to man, wildlife, and water.
    a. Describe the importance of forestry in the local, county, and state economy.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    M7

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
51. Identify properties of wood.
    a. Describe wood hardness.
    b. Describe weight of wood.
    c. Describe the shrinkage of wood.
    d. Describe warping of wood.
    e. Describe wood working qualities.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

52. Identify species of trees.
    a. Describe hardwoods.
    b. Describe softwoods.
    c. Collect leaves to determine species.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

53. Identify principles of forest management.
    a. Describe management practices of growing a wood lot.
    b. Describe the planning of a harvest cutting.
    c. Describe the practices of woodlot protection.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

54. Identify the characteristics of selected species of wildlife.
    a. Describe vertebrates and invertebrates.
    b. Describe predators.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

55. Explain interdependency occurring within the wildlife community.
    a. Describe parasitism.
    b. Observe parasitism.
    c. Describe mutualism.
    d. Observe mutualism.
    e. Describe predation.
    f. Observe predation.
    g. Describe commensalism.
    h. Describe competition.
    i. Observe competition.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

56. Conduct contamination analyses.
    a. Test water, air, and soil for contaminants.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

57. The student will identify the external parts of an insect.
    a. Label the wings, legs, mouth, head, thorax, and antenna of an insect.
    b. Identify common agricultural pests according to stages of their life cycle.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

58. Explain the functions of each major part of an insect.
    a. Describe the functions of insect wings.
    b. Describe the functions of the mouth parts including chewing and biting, piercing and sucking, siphoning, and sponging.
    c. Describe the functions of legs of an insect.
    d. Describe the functions of the head of an insect.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

59. Collect specimens and classify them according to their characteristics.
    a. Classify according to sucking, piercing, siphoning, sponging, and chewing and biting mouth parts.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

60. Apply an integrated pest management plan in the greenhouse.
    a. Develop an integrated pest management plan for use in the greenhouse.
    b. Implement an integrated pest management plan in the greenhouse.
    c. Evaluate an integrated pest management plan.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

61. Explain contributions which biotechnology makes to agriculture.
    a. Describe frost protection.
    b. Describe photosynthesis research.
    c. Describe disease resistance.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S7, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
62. Explain the role of DNA and RNA in living creatures.
    a. Describe DNA.
    b. Describe RNA.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S7, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
63. Identify methods of transferring genetic information.
    a. Describe gene splicing.
    b. Describe particle gun transformation.
    c. Describe tissue culture.
    d. Perform tissue culture.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S7, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6
64. Explain terms related to agriscience career opportunities.
    a. Define terms related to agriscience career opportunities.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C6
    Workplace Skills (See Appendix B):
    WP1, WP2, WP3, WP6
65. Explain the opportunities for agriscience careers.
    a. Describe horticulture careers.
    b. Describe agriscience mechanics careers.
    c. Describe agriscience supplies and service careers.
    d. Describe forestry careers.
    e. Describe agriscience processing, products, and distribution careers.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP3, WP6

66. Identify educational requirements for agribusiness careers.
    a. Describe courses of study in middle and high schools.
    b. Describe programs of study in community colleges and universities.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C6
    Workplace Skills (See Appendix B):
    WP1, WP2, WP3, WP6
67. Set personal goals for career and development.
    a. Establish short- and long-range personal and career goals.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C6
    Workplace Skills (See Appendix B):
    WP1, WP2, WP3, WP6
68. Prepare for employment interview.
    a. Participate in a role-play interview.
    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C6
    Workplace Skills (See Appendix B):
    WP1, WP2, WP3, WP6

CURRICULUM FRAMEWORK

Course Name: Agriscience II

Course CIP Code: 02.9992

Course Description: Agriscience II is the advanced level course of the secondary Agriscience program. Students in Agriscience II will gain foundation competencies related to careers in Agriscience, communication skills, developing a supervised agricultural experience program in agriscience, advanced biotechnology, food science, advanced plant science, advanced soil science, environmental science, aquaculture, and advanced animal science. (2-2½ Carnegie units, depending upon time spent in the course)

Competencies and Suggested Objectives:

1. Describe steps in preparing an oral presentation.
   a. Identify a topic in agriscience.
   b. Develop an outline.
   c. Collect data.
   d. Compile data.
   e. Draft speech.
   f. Prepare presentation.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
2. Apply basic principles of public speaking.
   a. Demonstrate principles of voice utilization.
   b. Demonstrate principles of stage presence.
   c. Demonstrate principles of composition of manuscript.
   d. Demonstrate principles of power of expression.
   e. Demonstrate principles of response to questions.
   f. Demonstrate principles of general effect.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
3. Present a 6 to 8 minute speech on an agriscience topic.
   a. Prepare and present a 6 to 8 minute speech on an agriscience topic utilizing the basic principles of public speaking.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP3, WP6

4. Continue SAE activities (ongoing).
   a. Continue to develop the SAE in Agriscience.

Related Academic Topics (See Appendix A):
C1, C2, C4, C6
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

5. Maintain agricultural records for the SAE.
   a. Prepare income and expense records.
   b. Prepare inventory records
   c. Compute enterprise summaries.
   d. Maintain placement records.
   e. Summarize the SAE program.
   f. Maintain leadership activity records.
   g. Compute a net worth statement.
   h. Fill out proficiency award and State FFA degree applications.

Related Academic Topics (See Appendix A):
C1, C2, C4, C6
M1, M7
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

6. Explain terms associated with biotechnology.
   a. Define terms associated with biotechnology.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

7. Explain the benefits of biotechnology.
   a. Describe the benefits of biotechnology to plants.
   b. Describe the benefits of biotechnology to animals and humans.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

8. Explain concerns about biotechnology.
   a. Describe concerns about biotechnology.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

9. Explain the environmental impact of biotechnology.
   a. Describe the environmental impact of biotechnology.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

10. Explain the regulatory control of biotechnology research and industry.
    a. Identify biotechnology regulatory agencies.
    b. Identify the product protection laws.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

11. Explain ethical issues impacting biotechnology.
    a. Describe ethical issues impacting biotechnology.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

12. Indicate the companies in the biotechnology industry.
    a. Identify dedicated biotechnology companies.
    b. Identify large diversified companies with biotechnology interests.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

13. Explain career opportunities in biotechnology.
    a. Describe sample work areas of biotechnology in agriculture.
    b. Describe biotechnology related work areas.
    c. Describe positions, salary ranges, and educational requirements for careers in biotechnology.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

14. Apply procedures of tissue culture.
    a. Conduct a tissue culture experiment.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
S7, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

15. Explain nutritional needs of humans and their functions.
    a. Describe the function of fat in human nutrition.
    b. Describe the function of proteins in human nutrition.
    c. Describe the function of carbohydrates in human nutrition.
    d. Describe the function of vitamins in human nutrition.
    e. Describe the function of minerals in human nutrition.
    f. Describe the function of water in human nutrition.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

16. Explain the food groups which provide the essential nutritional requirements for human nutrition.
    a. Describe the essential nutrients proved by the food groups according to the Food Pyramid.
    b. Describe the essential nutrients proved by the bread and cereal group.
    c. Describe the essential nutrients proved by the milk and cheese group.
    d. Describe the essential nutrients proved by the meat, fish, poultry, and bean group.
    e. Describe the essential nutrients proved by the fats and sweets group.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

17. Explain food customs around the world.
    a. Describe food customs around the world.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

18. Apply processes of making yogurt.
    a. Culture bacteria to make yogurt.
    b. Analyze helpful and harmful bacteria.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

19. Define terms associated with hydroponics.
    a. Describe media, medium, hydroponics, amendment, pH, acidity, alkalinity, neutral, primary nutrients, complete fertilizer, starter solutions, water culture, and aquaculture.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

20. Identify requirements for hydroponics plant production.
    a. Describe the requirements for water, oxygen, mineral nutrients, light, spacing, temperature, and support.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

21. Explain types of hydroponics systems.
    a. Describe the aggregate culture hydroponics system.
    b. Describe the water culture hydroponics system.
    c. Describe the aeroponics hydroponics system.
    d. Describe the continuous flow hydroponics system.
    e. Build a hydroponic system.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

22. Apply greenhouse management.
    a. Demonstrate insect control.
    b. Demonstrate disease control.

c. Demonstrate watering systems.
d. Demonstrate utilization of space.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S3, S8

Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

23. Explain procedures to apply for a restricted pest management permit.
    a. Apply for a restricted pest management permit.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4, C5
    S3, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

24. Explain functions of soil nutrients in plant growth.
    a. Describe macro nutrients.
    b. Describe micro nutrients.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S5, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

25. Determine soil nutrients present in soil samples.
    a. Identify macro nutrients.
    b. Identify micro nutrients.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S5, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

26. Perform soil testing and interpret results.
    a. Conduct a soil test for pH, N, P, and K.
    b. Interpret the soil test results.
    c. Prepare fertilizer recommendations.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S5, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

27. Interpret soil analysis survey.
    a. Collect and send soil sample for analysis.
    b. Analyze results.
    c. Make recommendations.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4

S5, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

28. Identify major components of air.
    a. Describe the major components of air related to plant and animal life.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4

M4, M7

S4, S5, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

29. Describe the importance of air quality as it relates to humans and other living organisms.
    a. Analyze the importance of air quality as it relates to humans and other living organisms.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4

M4, M7

S4, S5, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

30. Identify common threats to air quality.
    a. Describe loss of air quality as a result of sulphur.
    b. Describe loss of air quality as a result of hydrocarbons.
    c. Describe loss of air quality as a result of nitrous oxides and lead.
    d. Describe loss of air quality as a result of carbon monoxide.
    e. Describe loss of air quality as a result of radon.
    f. Describe loss of air quality as a result of radioactive dust and materials.
    g. Describe loss of air quality as a result of chlorofluorocarbons.
    h. Describe loss of air quality as a result of pesticide and spray materials.
    i. Describe loss of air quality as a result of asbestos.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4

M4, M7

S4, S5, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

31. Explain practices to reduce air pollution.
    a. Describe practices to reduce air pollution.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

32. Identify terms related to environmental quality.
    a. Define terms related to air quality, water quality, and soil quality.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

33. Cite important relationships between land characteristics and water quality.
    a. Describe precipitation.
    b. Describe land as a reservoir.
    c. Describe types of ground water.
    d. Describe benefits of living organisms.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

34. Explain major threats to water quality.
    a. Describe major threats to water quality.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

35. Test local water system for possible contamination.
    a. Analyze results of local water system tests.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

36. Plan an experiment to determine the effect of soil water on plant growth.
    a. Design and conduct an experiment to determine the effect of soil water on plant growth.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

37. Design and construct a project to demonstrate concepts of erosion control.
    a. Demonstrate the effects of the force of raindrops on soils.
    b. Demonstrate the effects of the soil aggregation on absorption.
    c. Demonstrate the effects of slope on erosion.
    d. Demonstrate the effects of living grass on erosion control.
    e. Demonstrate the effects of plant residue on erosion control.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    M4, M7
    S4, S5, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

38. Explain terms associated with aquaculture.
    a. Define terms associated with aquaculture.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S2, S3, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

39. Explain the aquaculture food chain.
    a. Describe the role of plants in the aquaculture food chain.
    b. Describe the role of microbes in the aquaculture food chain.
    c. Describe the role of fish in the aquaculture food chain.
    d. Describe the role of insects in the aquaculture food chain.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S2, S3, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

40. Explain the major aquaculture production systems.
    a. Describe caged culture.
    b. Describe recirculating tanks.
    c. Describe hatcheries.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S2, S3, S8
    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

41. Plan a small-scale aquaculture production system.
    a. Develop a small-scale aquaculture production system.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    M1, M4, M7
    S2, S3, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

42. Explain terms related to advanced animal science.
    a. Define terms related to advanced animal science.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S3, S7, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

43. Explain how animal traits are passed on to offspring and which traits are best transferred.
    a. Describe chromosomes.
    b. Describe desirable characteristics.
    c. Describe heredity.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S3, S7, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

44. Explain growth promoters for animals.
    a. Describe how supplements promote growth.
    b. Describe growth promoter implants.
    c. Describe the effects of antibiotic feed additives.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    S3, S7, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

45. Explain the need and methods for checking the vital signs.
    a. Describe heart rate and body temperature of different species of animals.
    b. Demonstrate procedures for checking vital signs.

    Related Academic Topics (See Appendix A):
    C1, C2, C3, C4
    M1, M4, M7
    S3, S7, S8

    Workplace Skills (See Appendix B):
    WP1, WP2, WP4, WP6

46. Explain the need for and processes of artificial insemination in animals.
    a. Describe the processes used and the need for artificial insemination in animal science.
    b. Perform the processes used in artificial insemination of livestock.
    c. Observe procedures for embryo transfer.

    Related Academic Topics (See Appendix A):

    C1, C2, C3, C4

    S3, S7, S8

    Workplace Skills (See Appendix B):

    WP1, WP2, WP4, WP6

SECTION II:

CURRICULUM GUIDE

FOR

AGRISCIENCE

AGRISCIENCE I

AGRISCIENCE I
UNIT 1: INTRODUCTION TO AGRISCIENCE **(5 days)**

Competencies and Suggested Objectives:

1. Describe vocational student organization activities that relate to and support the instructional program.
   a. Identify vocational student organization activities supporting the instructional program.
   b. Determine what procedures are needed to participate in vocational student organization activities.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
2. Compile information on careers in agriscience.
   a. Identify career opportunities in agriscience.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
3. Apply leadership skills needed in agriscience.
   a. Demonstrate leadership skills in speaking.
   b. Demonstrate leadership skills in conducting a meeting using "Roberts Rules of Order."

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Describe vocational student organization activities that relate to and support the instructional program.*
   a. Discussion and media on vocational student organization activities supporting the instructional program.
   b. Written report on what procedures are needed to participate in vocational student organization activities.
2. *Compile information on careers in agriscience.*
   a. Written report on career opportunities in agriscience.

3. *Apply leadership skills needed in agriscience.*
   a. *Performance exercise to demonstrate leadership skills in visual presentation. Participate in FFA contests, degree programs, and awards programs.*
   b. *Performance exercise to demonstrate leadership skills in conducting an FFA meeting.*

Suggested Assessment Strategies:

1. *Describe vocational student organization activities that relate to and support the instructional program.*
   a. *Test - Identify vocational student organization activities supporting the instructional program.*
   b. *Assignment - Determine what procedures are needed to participate in vocational student organization activities.*
2. *Compile information on careers in agriscience.*
   a. *Test - Identify career opportunities in agriscience.*
3. *Apply leadership skills needed in agriscience.*
   a. *Performance Activity - Demonstrate leadership skills in visual presentation.*
   b. *Performance Activity - Demonstrate leadership skills in conducting a meeting.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Instructional Materials Service. Exploring Career Opportunities in Agriculture. Catalog #1050. College Station, TX: Texas A&M University.

National FFA Organization. FFA Manual. Alexandria, VA: Author. 1995.

Patton, Bob and Harp, Keith. Vocational Agriculture I. Stillwater, OK: Oklahoma Department of Vocational and Technical Education. 1984.

AGRISCIENCE I
UNIT 2: APPLICATION OF THE SCIENTIFIC METHOD IN AGRISCIENCE (5 days)

Competencies and Suggested Objectives:

1. Identify a problem to be solved.
   a. Describe the identified problem and how the scientific method can be used to solve it.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Apply the scientific method in problem solving.
   a. Identify the problem or question to be answered.
   b. Gather data related to the problem or question.
   c. Formulate possible solutions.
   d. Implement one or a combination of solutions.
   e. Evaluate the results and pursue further research as needed.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Identify a problem to be solved.*
   a. *Discussion and media on the identified problem and how the scientific method can be used to solve it.*
2. *Apply the scientific method in problem solving.*
   a. *Written report on the problem or question to be answered using a teacher selected lab exercise.*
   b. *Written report on data related to the problem or question using a teacher selected lab exercise.*
   c. *Written report on possible solutions using a teacher selected lab exercise.*
   d. *Written report on one or a combination of solutions using a teacher selected lab exercise.*
   e. *Written report on the results and pursue further research as needed using a teacher selected lab exercise.*

Suggested Assessment Strategies:

1. *Identify a problem to be solved.*
   a. *Test - Describe the identified problem and how the scientific method can be used to solve it.*
2. *Apply the scientific method in problem solving.*
   a. *Assignment - Identify the problem or question to be answered.*
   b. *Assignment - Gather data related to the problem or question.*
   c. *Assignment - Formulate possible solutions.*
   d. *Assignment - Implement one or a combination of solutions.*
   e. *Assignment - Evaluate the results and pursue further research as needed.*

Suggested References:

Johnson, D. M. (Ed.) Agriscience Learning Activities Manual. Mississippi State University, MS: RCU. 1991.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

AGRISCIENCE I
UNIT 3: HUMAN RELATIONS/LEADERSHIP/FFA ACTIVITIES (15 days)

Competencies and Suggested Objectives:

1. Explain FFA organizational activities that promote and recognize achievements in agriscience.
   a. Describe contests and awards programs.
   b. Participate in personal development seminars.
   c. Attend leadership activities, conferences, and/or conventions.
   d. Explain national and international exchange programs.
   e. Plan for educational experience with industry.
   f. Determine opportunities for participation in personal and community development programs.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6
2. Identify the benefits of FFA participation to an individual and to the agricultural industry.
   a. Describe personal growth and development opportunities through participation in activity programs of the agricultural industry.
   b. Explain benefits of exposure to the agricultural industry environment and multicultural experiences.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6
3. Explain opportunities for members in the FFA organization.
   a. Identify opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6
4. Develop and present a 3-5 minute speech on an agricultural topic.
   a. Utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6

5. Explain the purposes and functions of parliamentary procedure.
   a. Conduct a meeting.
   b. Describe different methods of voting and handling of motions.
   c. Assume officer positions and describe their functions.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Explain FFA organizational activities that promote and recognize achievements in agriscience.*
   a. *Discussion and media on contests and awards programs.*
   b. *Assist students to participate in personal development seminars.*
   c. *Assist students to participate in leadership activities, conferences, and/or conventions.*
   d. *Discussion and media on national and international exchange programs.*
   e. *Assist students to participate in educational experience with industry.*
   f. *Assist students to participate in personal and community development programs.*
2. *Identify the benefits of FFA participation to an individual and to the agricultural industry.*
   a. *Written report on personal growth and development opportunities through participation in activity programs of the agricultural industry.*
   b. *Written report on benefits of exposure to the agricultural industry environment and multicultural experiences.*
3. *Explain opportunities for members in the FFA organization.*
   a. *Written and oral report on opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*
4. *Develop and present a 3-5 minute speech on an agricultural topic.*
   a. *Performance exercise to utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.*
5. *Explain the purposes and functions of parliamentary procedure.*
   a. *Performance exercise to conduct a meeting.*
   b. *Discussion and media on different methods of voting and handling of motions.*
   c. *Performance exercise to assume officer positions and perform their functions.*

Suggested Assessment Strategies:

1. *Explain FFA organizational activities that promote and recognize achievements in agriscience.*
   a. *Test - Describe contests and awards programs.*
   b. *Assignment - Participate in personal development seminars.*
   c. *Assignment - Attend leadership activities, conferences, and/or conventions.*
   d. *Test - Explain national and international exchange programs.*
   e. *Assignment - Plan for educational experience with industry.*
   f. *Assignment - Determine opportunities for participation in personal and community development programs.*
2. *Identify the benefits of FFA participation to an individual and to the agricultural industry.*
   a. *Assignment - Describe personal growth and development opportunities through participation in activity programs of the agricultural industry.*
   b. *Assignment - Explain benefits of exposure to the agricultural industry environment and multicultural experiences.*
3. *Explain opportunities for members in the FFA organization.*
   a. *Assignment - Identify opportunities for personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*
4. *Develop and present a 3-5 minute speech on an agricultural topic.*
   a. *Performance Activity - Utilize guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.*
5. *Explain the purposes and functions of parliamentary procedure.*
   a. *Performance Activity - Conduct a meeting.*
   b. *Test - Describe different methods of voting and handling of motions.*
   c. *Assignment - Assume officer positions and describe their functions.*

Suggested References:

Cooper, E. L. Agriscience: Fundamentals & Applications. Albany, NY, Delmar. 1990.

National FFA Organization. FFA Proficiency Awards and Degree Software. Alexandria, VA: Author. Current edition.

National FFA Organization. FFA Manual. Alexandria, VA: Author. 1995.

National FFA Organization. FFA Student Handbook. Alexandria, VA: Author. 1993.

National FFA Organization. National FFA Contests. (Bulletin No. 4). Alexandria, VA: Author. 1992-93.

Robert's Rules of Order.

AGRISCIENCE I
UNIT 4: DEVELOPING A SUPERVISED AGRICULTURAL EXPERIENCE PROGRAM (SAE) IN AGRISCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Describe the purposes and requirements of the SAE.
   a. Establish objectives for the SAE.
   b. Determine the availability of time and money to invest.
   c. Select a system of record keeping.
   d. Determine benefits of participation in the SAE.
   e. Determine types of SAE programs.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Develop a long-range personal plan for the SAE.
   a. Set long-range goals.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Develop a short-range personal plan.
   a. Set short-range goals.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Complete a training agreement for the SAE.
   a. Establish requirements of student, parents, supervisor, and/or employer.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
5. Describe agricultural record keeping for the SAE.
   a. Determine which records to keep, why, and how to maintain each system.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

6. Maintain agricultural records for the SAE.
   a. Prepare income and expense records.
   b. Prepare inventory records.
   c. Compute enterprise summaries.
   d. Maintain placement records.
   e. Summarize the SAE program.
   f. Maintain leadership activity records.
   g. Compute a net worth statement.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Describe the purposes and requirements of the SAE.*
   a. *Assist students to plan for objectives for the SAE.*
   b. *Assist students to plan for the availability of time and money to invest.*
   c. *Assist students to plan for a system of record keeping.*
   d. *Assist students to identify benefits of participation in the SAE.*
   e. *Assist students to determine types of SAE programs.*
2. *Develop a long-range personal plan for the SAE.*
   a. *Performance exercise to set long-range goals for the SAE.*
3. *Develop a short-range personal plan.*
   a. *Performance exercise to set short-range goals.*
4. *Complete a training agreement for the SAE.*
   a. *Performance exercise to establish requirements of student, parents, supervisor, and/or employer.*
5. *Describe agricultural record keeping for the SAE.*
   a. *Assist students to determine which records to keep, why, and how to maintain each system.*
6. *Maintain agricultural records for the SAE.*
   a. *Performance exercise to prepare income and expense records.*
   b. *Performance exercise to prepare inventory records.*
   c. *Performance exercise to compute enterprise summaries.*
   d. *Performance exercise to maintain placement records.*
   e. *Performance exercise to summarize the SAE program.*
   f. *Performance exercise to maintain leadership activity records.*
   g. *Performance exercise to compute a net worth statement.*

Suggested Assessment Strategies:

1. *Describe the purposes and requirements of the SAE.*
   a. *Assignment - Establish objectives for the SAE.*

   b. *Assignment - Determine the availability of time and money to invest.*
   c. *Assignment - Select a system of record keeping.*
   d. *Assignment - Determine benefits of participation in the SAE.*
   e. *Assignment - Determine types of SAE programs.*
2. *Develop a long-range personal plan for the SAE.*
   a. *Performance Activity - Set long-range goals.*
3. *Develop a short-range personal plan.*
   a. *Performance Activity - Set short-range goals.*
4. *Complete a training agreement for the SAE.*
   a. *Performance Activity - Establish requirements of student, parents, supervisor, and/or employer.*
5. *Describe agricultural record keeping for the SAE.*
   a. *Assignment - Determine which records to keep, why, and how to maintain each system.*
6. *Maintain agricultural records for the SAE.*
   a. *Performance Activity - Prepare income and expense records.*
   b. *Performance Activity - Prepare inventory records.*
   c. *Performance Activity - Compute enterprise summaries.*
   d. *Performance Activity - Maintain placement records.*
   e. *Performance Activity - Summarize the SAE program.*
   f. *Performance Activity - Maintain leadership activity records.*
   g. *Performance Activity - Compute a net worth statement.*

Suggested References:

Cooper, E. L. Agriscience: Fundamentals & Applications. Albany, NY, Delmar. 1990.

Harp, K. and Stewart, J. Vocational Agriculture II. Stillwater, OK: Oklahoma State Department of Vocational and Technical Education. 1985.

National FFA Organization. FFA Manual. Alexandria, VA: Author. 1995

National FFA Organization. FFA Proficiency Awards and Degree Software. Alexandria, VA: Author. Current edition.

National FFA Organization. FFA Student Handbook. Alexandria, VA: Author. 1993.

National FFA Organization. National FFA Contests (Bulletin No. 4). Alexandria, VA: Author. 1992-93.

Robert's Rules of Order.

AGRISCIENCE I
UNIT 5: AGRICULTURAL INFORMATION SYSTEMS (15 days)

Competencies and Suggested Objectives:

1. Produce information for use by others and make it available on the Internet.
   a. Develop ASCII text documents containing student generated information related to agriscience.
   b. Author files using hypertext markup language (HTML)
   c. Create/maintain Home Pages on the World Wide Web.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C5, C6

   Workplace Skills (See Appendix B):
   WP2, WP3, WP4, WP5, WP6

Suggested Teaching Strategies:

1. *Produce information for use by others and make it available on the Internet.*
   a. *Performance exercise to develop ASCII text documents containing student generated information related to agriscience.*
   b. *Performance exercise to author files using hypertext markup language (HTML)*
   c. *Performance exercise to create/maintain Home Pages on the World Wide Web.*

Suggested Assessment Strategies:

1. *Produce information for use by others and make it available on the Internet.*
   a. *Performance Activity - Develop ASCII text documents containing student generated information related to agriscience.*
   b. *Performance Activity - Author files using hypertext markup language (HTML)*
   c. *Performance Activity - Create/maintain Home Pages on the World Wide Web.*

Suggested References:

Newman, M. E. and Willis, W. J. Agribusiness Management and Entrepreneurship. Danville, IL: Interstate. 1994.

AGRISCIENCE I
UNIT 6: ANIMAL SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Explain the roles and functions of major body systems.
   a. Describe the roles and functions of major body systems including circulatory, respiratory, muscular, excretory, nervous, skeletal, integument, digestive, urinary, and endocrine.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
2. Identify major differences in body systems among species.
   a. Compare major differences in body systems among species.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
3. Explain the nutrients required by animals for normal growth and development.
   a. Describe the purpose of nutrients required by animals for normal growth and development including carbohydrates, fats, proteins, vitamins, minerals, and water.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
4. Identify nutrient sources and functions for animals.
   a. Describe roughages.
   b. Describe concentrates.
   c. Describe animal byproducts.
   d. Describe minerals.
   e. Describe synthetic nutrients.
   f. Analyze feed samples.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6

5. Develop a ration for a specific species and class of animal.
   a. Balance a ration using the Pearson Square.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M1, M7
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
6. Classify and explain animal diseases.
   a. Describe bacterial diseases.
   b. Describe viral diseases.
   c. Describe environmental diseases.
   d. Describe parasitic diseases.
   e. Collect a blood sample and analyze for parasites and/or disease.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
7. Explain methods of controlling diseases.
   a. Describe sanitation.
   b. Describe isolation.
   c. Describe vaccination.
   d. Demonstrate vaccination procedures.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
8. Explain the risks to humans from contagious and non-contagious diseases and parasites.
   a. Describe risks to humans from contagious diseases and parasites.
   b. Describe risks to humans from non-contagious diseases and parasites.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S1, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
9. Explain procedures to apply for a pest applicator's license.
   a. Apply for a pest applicator's license.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S1, S5, S8
Workplace Skills (See Appendix B):
WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain the roles and functions of major body systems.*
   a. *Discussion and media on the roles and functions of major body systems including circulatory, respiratory, muscular, excretory, nervous, skeletal, integument, digestive, urinary, and endocrine.*
2. *Identify major differences in body systems among species.*
   a. *Discussion and media on major differences in body systems among species.*
3. *Explain the nutrients required by animals for normal growth and development.*
   a. *Discussion and media on the purpose of nutrients required by animals for normal growth and development including carbohydrates, fats, proteins, vitamins, minerals, and water.*
4. *Identify nutrient sources and functions for animals.*
   a. *Discussion and media on roughages.*
   b. *Discussion and media on concentrates.*
   c. *Discussion and media on animal byproducts.*
   d. *Discussion and media on minerals.*
   e. *Discussion and media on synthetic nutrients.*
   f. *Practical exercise to analyze feed samples and content labels.*
5. *Develop a ration for a specific species and class of animal.*
   a. *Performance exercise to balance a ration using the Pearson Square.*
6. *Classify and explain animal diseases.*
   a. *Discussion and media on bacterial diseases.*
   b. *Discussion and media on viral diseases.*
   c. *Discussion and media on environmental diseases.*
   d. *Discussion and media on parasitic diseases.*
   e. *Performance exercise to collect a blood sample and analyze for parasites and/or disease.*
7. *Explain methods of controlling diseases.*
   a. *Discussion and media on sanitation.*
   b. *Discussion and media on isolation.*
   c. *Discussion and media on vaccination.*
   d. *Performance exercise to demonstrate vaccination procedures.*
8. *Explain the risks to humans from contagious and non-contagious diseases and parasites.*
   a. *Discussion and media on risks to humans from contagious diseases and parasites.*

b. *Discussion and media on risks to humans from non-contagious diseases and parasites.*

9. *Explain procedures to apply for a pest applicator's license.*
   a. *Assist students to apply for a pest applicator's license.*

Suggested Assessment Strategies:

1. *Explain the roles and functions of major body systems.*
   a. *Test - Describe the roles and functions of major body systems including circulatory, respiratory, muscular, excretory, nervous, skeletal, integument, digestive, urinary, and endocrine.*
2. *Identify major differences in body systems among species.*
   a. *Test - Compare major differences in body systems among species.*
3. *Explain the nutrients required by animals for normal growth and development.*
   a. *Test - Describe the purpose of nutrients required by animals for normal growth and development including carbohydrates, fats, proteins, vitamins, minerals, and water.*
4. *Identify nutrient sources and functions for animals.*
   a. *Test - Describe roughages.*
   b. *Test - Describe concentrates.*
   c. *Test - Describe animal byproducts.*
   d. *Test - Describe minerals.*
   e. *Test - Describe synthetic nutrients.*
   f. *Performance Activity - Analyze feed samples.*
5. *Develop a ration for a specific species and class of animal.*
   a. *Performance Activity - Balance a ration using the Pearson Square.*
6. *Classify and explain animal diseases.*
   a. *Test - Describe bacterial diseases.*
   b. *Test - Describe viral diseases.*
   c. *Test - Describe environmental diseases.*
   d. *Test - Describe parasitic diseases.*
   e. *Performance Activity - Collect a blood sample and analyze for parasites an/or disease.*
7. *Explain methods of controlling diseases.*
   a. *Test - Describe sanitation.*
   b. *Test - Describe isolation.*
   c. *Test - Describe vaccination.*
   d. *Performance Activity - Demonstrate vaccination procedures.*
8. *Explain the risks to humans from contagious and non-contagious diseases and parasites.*
   a. *Test - Describe risks to humans from contagious diseases and parasites.*
   b. *Test - Describe risks to humans from non-contagious diseases and parasites.*

9. Explain procedures to apply for a pest applicator's license.
a. Assignment - Apply for a pest applicator's license.

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Gillespie, J. R. Modern Livestock and Poultry Production (4th ed). Albany, NY: Delmar. 1992.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

AGRISCIENCE I
UNIT 7: MECHANICAL SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Explain Ohm's law.
   a. Solve problems using Ohm's law.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M1, M4, M7
   S6, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP5, WP6
2. Explain magnetism.
   a. Describe the basic principles of magnetism.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M1, M4, M7
   S6, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP5, WP6
3. Measure temperatures using Celsius, Kelvin, and Fahrenheit scales.
   a. Convert temperature between Celsius, Kelvin, and Fahrenheit scales.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M1, M4, M7
   S6, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP5, WP6
4. Explain the operating principles of internal combustion temperatures.
   a. Define piston displacement.
   b. Determine compression ratio of various engines.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M1, M4, M7
   S6, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP5, WP6
5. Explain principles and applications of fluid power machines.
   a. Define hydraulics.
   b. Calculate mechanical advantage.

c. Demonstrate principles of hydraulics.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4, C5
M1, M4, M7
S6, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP5, WP6

6. Use a voltmeter.
   a. Calculate watts, amperes, and volts.
   b. Calculate kilowatt hours.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4, C5
M1, M4, M7
S6, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP5, WP6

Suggested Teaching Strategies:

1. *Explain Ohm's law.*
   a. *Assist students to solve problems using Ohm's law.*
2. *Explain magnetism.*
   a. *Discussion and media on the basic principles of magnetism.*
3. *Measure temperatures using Celsius, Kelvin, and Fahrenheit scales.*
   a. *Assist students to convert temperature between Celsius, Kelvin, and Fahrenheit scales.*
4. *Explain the operating principles of internal combustion temperatures.*
   a. *Discussion and media on piston displacement.*
   b. *Performance exercise to determine compression ratio of various engines.*
5. *Explain principles and applications of fluid power machines.*
   a. *Discussion and media on hydraulics.*
   b. *Performance exercise to demonstrate mechanical advantage.*
   c. *Performance exercise to demonstrate principles of hydraulics.*
6. *Use a voltmeter.*
   a. *Performance exercise to calculate watts, amperes, and volts.*
   b. *Performance exercise to calculate kilowatt hours.*

Suggested Assessment Strategies:

1. *Explain Ohm's law.*
   a. *Assignment - Solve problems using Ohm's law.*
2. *Explain magnetism.*
   a. *Test - Describe the basic principles of magnetism.*

3. *Measure temperatures using Celsius, Kelvin, and Fahrenheit scales.*
   a. *Assignment - Convert temperature between Celsius, Kelvin, and Fahrenheit scales.*
4. *Explain the operating principles of internal combustion temperatures.*
   a. *Test - Define piston displacement.*
   b. *Assignment - Determine compression ratio of various engines.*
5. *Explain principles and applications of fluid power machines.*
   a. *Test - Define hydraulics.*
   b. *Assignment - Calculate mechanical advantage.*
   c. *Performance Activity - Demonstrate principles of hydraulics.*
6. *Use a voltmeter.*
   a. *Assignment - Calculate watts, amperes, and volts.*
   b. *Assignment - Calculate kilowatt hours.*

Suggested References:

Buriak, P. & Osborne, E. W. Physical Science Applications in Agriculture. Danville, IL: Interstate. 1995.

Cooper, E. L. Agricultural Mechanics: Fundamentals and Applications (2nd ed.). Albany, NY: Delmar. 1991.

Johnson, D. M. and Lawver, D. E. Mechanical Technology in Agriculture. Danville, IL: Interstate. 1995.

Olivo, C. T. & Olivo, T. P. Fundamentals of Applied Physics. Albany, NY: Delmar. 1984.

AGRISCIENCE I
UNIT 8: PRINCIPLES OF FIBER SCIENCE **(5 days)**

Competencies and Suggested Objectives:

1. Identify terms related to fiber science.
   a. Define terms related to fiber science.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain the fiber industry in relation to clothing, paper, and textiles.
   a. Describe the fiber industry in relation to clothing.
   b. Describe the fiber industry in relation to paper.
   c. Describe the fiber industry in relation to textiles.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Explain the economic importance of fiber.
   a. Describe money generated in the fiber industry.
   b. Describe the need for plant fibers.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Explain the ginning process for cotton.
   a. Describe the ginning process for cotton including fiber and the byproducts of seed, hulls, and oil.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

5. Explain the paper making process.
   a. Describe the paper making process including types of paper and the byproducts produced.
   b. Recycle paper into a usable product.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Identify terms related to fiber science.*
   a. *Discussion and media on terms related to fiber science.*
2. *Explain the fiber industry in relation to clothing, paper, and textiles.*
   a. *Written/oral report to describe the fiber industry in relation to clothing.*
   b. *Written/oral report to describe the fiber industry in relation to paper.*
   c. *Written/oral report to describe the fiber industry in relation to textiles.*
3. *Explain the economic importance of fiber.*
   a. *Written/oral report to describe money generated in the fiber industry.*
   b. *Written/oral report to describe the need for plant fibers.*
4. *Explain the ginning process for cotton.*
   a. *Field trip to observe the ginning process for cotton including fiber and the byproducts of seed, hulls, and oil.*
5. *Explain the paper making process.*
   a. *Field trip to observe the paper making process including types of paper and the byproducts produced.*
   b. *Performance exercise to recycle paper into a usable product.*

Suggested Assessment Strategies:

1. *Identify terms related to fiber science.*
   a. *Test - Define terms related to fiber science.*
2. *Explain the fiber industry in relation to clothing, paper, and textiles.*
   a. *Assignment - Describe the fiber industry in relation to clothing.*
   b. *Assignment - Describe the fiber industry in relation to paper.*
   c. *Assignment - Describe the fiber industry in relation to textiles.*
3. *Explain the economic importance of fiber.*
   a. *Assignment - Describe money generated in the fiber industry.*
   b. *Assignment - Describe the need for plant fibers.*
4. *Explain the ginning process for cotton.*
   a. *Assignment - Describe the ginning process for cotton including fiber and the byproducts of seed, hulls, and oil.*

5. *Explain the paper making process.*
   a. *Assignment - Describe the paper making process including types of paper and the byproducts produced.*
   b. *Performance Activity - Recycle paper into a usable product.*

Suggested References:

Lee, J. S. and Turner, D. L. Introduction to World Agriscience and Technology. Danville, IL: Interstate. 1994.

AGRISCIENCE I
UNIT 9: PLANT SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Explain terms associated with plant science.
   a. Define terms associated with plant science.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8
   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
2. Categorize the classes of agricultural plants.
   a. Classify plants by life cycle.
   b. Identify parts of plants.
   c. Describe functions of plant parts.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8
   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
3. Determine the nutrients needed for proper plant growth.
   a. Identify secondary and primary plant nutrients.
   b. Determine fertilizer types and amounts needed by plants for proper growth.
   c. Analyze the effects of nutrients on plants.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8
   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
4. Describe common plant pests and diseases and control methods.
   a. Identify common plant pests.
   b. Identify common plant diseases.
   c. Determine methods of pest control.
   d. Determine methods of disease control.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8
   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
5. Compare the activities in a plant during exposure to light and darkness.
   a. Describe photosynthesis.

b. Describe the light conversion process.
c. Analyze the effects of nutrients on plants.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S2, S8

Workplace Skills (See Appendix B):
WP2, WP4, WP6

6. Explain the various food storage processes in plants.
   a. Describe food storage in roots.
   b. Describe food storage in stems.
   c. Describe food storage in seeds.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
7. Distinguish between sexual and asexual reproduction.
   a. Describe sexual reproduction.
   b. Describe asexual reproduction.
   c. Demonstrate one method each of plant sexual and asexual reproduction.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6
8. Identify the reproductive parts of flowers and seeds.
   a. Draw the reproductive parts of a flower.
   b. Label the reproductive parts of a seed.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S2, S8

   Workplace Skills (See Appendix B):
   WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain terms associated with plant science.*
   a. *Discussion and media on terms associated with plant science.*
2. *Categorize the classes of agricultural plants.*
   a. *Written/oral report to classify plants by life cycle.*
   b. *Written/oral report to identify parts of plants.*
   c. *Written/oral report to describe functions of plant parts.*
3. *Determine the nutrients needed for proper plant growth.*
   a. *Written/oral report to identify secondary and primary plant nutrients.*

b. *Written/oral report to determine fertilizer types and amounts needed by plants for proper growth.*
c. *Performance exercise to analyze the effects of nutrients on plants.*

4. *Describe common plant pests and diseases and control methods.*
   a. *Written/oral report to identify common plant pests.*
   b. *Written/oral report to identify common plant diseases.*
   c. *Written/oral report to determine methods of pest control.*
   d. *Written/oral report to determine methods of disease control.*
5. *Compare the activities in a plant during exposure to light and darkness.*
   a. *Discussion and media on photosynthesis.*
   b. *Discussion and media on the light conversion process.*
   c. *Performance exercise to analyze the effects of nutrients on plants.*
6. *Explain the various food storage processes in plants.*
   a. *Discussion and media on food storage in roots.*
   b. *Discussion and media on food storage in stems.*
   c. *Discussion and media on food storage in seeds.*
7. *Distinguish between sexual and asexual reproduction.*
   a. *Discussion and media on sexual reproduction.*
   b. *Discussion and media on asexual reproduction.*
   c. *Performance exercise to demonstrate one method each of plant sexual and asexual reproduction.*
8. *Identify the reproductive parts of flowers and seeds.*
   a. *Performance exercise to draw the reproductive parts of a flower.*
   b. *Performance exercise to label the reproductive parts of a seed.*

Suggested Assessment Strategies:

1. *Explain terms associated with plant science.*
   a. *Test - Define terms associated with plant science.*
2. *Categorize the classes of agricultural plants.*
   a. *Assignment - Classify plants by life cycle.*
   b. *Assignment - Identify parts of plants.*
   c. *Assignment - Describe functions of plant parts.*
3. *Determine the nutrients needed for proper plant growth.*
   a. *Test - Identify secondary and primary plant nutrients.*
   b. *Assignment - Determine fertilizer types and amounts needed by plants for proper growth.*
   c. *Performance Activity - Analyze the effects of nutrients on plants.*
4. *Describe common plant pests and diseases and control methods.*
   a. *Assignment - Identify common plant pests.*
   b. *Assignment - Identify common plant diseases.*
   c. *Assignment - Determine methods of pest control.*
   d. *Assignment - Determine methods of disease control.*

5. *Compare the activities in a plant during exposure to light and darkness.*
   a. *Test - Describe photosynthesis.*
   b. *Test - Describe the light conversion process.*
   c. *Performance Activity - Analyze the effects of nutrients on plants.*
6. *Explain the various food storage processes in plants.*
   a. *Test - Describe food storage in roots.*
   b. *Test - Describe food storage in stems.*
   c. *Test - Describe food storage in seeds.*
7. *Distinguish between sexual and asexual reproduction.*
   a. *Test - Describe sexual reproduction.*
   b. *Test - Describe asexual reproduction.*
   c. *Performance Activity - Demonstrate one method each of plant sexual and asexual reproduction.*
8. *Identify the reproductive parts of flowers and seeds.*
   a. *Performance Activity - Draw the reproductive parts of a flower.*
   b. *Performance Activity - Label the reproductive parts of a seed.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

Towle, A. Modern Biology. Albany, NY: Holt, Rinehart, and Winston. 1989.

AGRISCIENCE I
UNIT 10: SOIL SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Determine soil textures from selected samples.
   a. Identify a clay based soil.
   b. Identify a sand based soil.
   c. Identify a silt based soil.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S4, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain factors affecting soil classification.
   a. Describe slope and drainage.
   b. Determine slope and drainage.
   c. Describe permeability.
   d. Determine permeability.
   e. Describe texture.
   f. Determine texture.
   g. Describe depth of top soil.
   h. Determine depth of top soil.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M1, M4, M7
   S4, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Describe methods used in determining soil capability classes.
   a. Apply soil capability classes to soil in local area.
   b. Identify soils in the local area using county soil survey maps.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S4, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Apply procedures for collecting soil samples.
   a. Collect a soil sample.
   b. Analyze a soil sample for primary nutrients and pH.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S4, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Determine soil textures from selected samples.*
   a. *Performance exercise to identify a clay based soil.*
   b. *Performance exercise to identify a sand based soil.*
   c. *Performance exercise to identify a silt based soil.*
2. *Explain factors affecting soil classification.*
   a. *Discussion and media on slope and drainage.*
   b. *Performance exercise to determine slope and drainage and participate in FFA Soil Judging Contest.*
   c. *Discussion and media on permeability.*
   d. *Performance exercise to determine permeability and participate in FFA Soil Judging Contest.*
   e. *Discussion and media on texture.*
   f. *Performance exercise to determine texture and participate in FFA Soil Judging Contest.*
   g. *Discussion and media on depth of top soil.*
   h. *Performance exercise to determine depth of top soil and participate in FFA Soil Judging Contest.*
3. *Describe methods used in determining soil capability classes.*
   a. *Performance exercise to apply soil capability classes to soil in local area and participate in FFA Soil Judging Contest.*
   b. *Performance exercise to identify soils in the local area using county soil survey maps.*
4. *Apply procedures for collecting soil samples.*
   a. *Performance exercise to collect a soil sample.*
   b. *Performance exercise to analyze a soil sample for primary nutrients and pH.*

Suggested Assessment Strategies:

1. *Determine soil textures from selected samples.*
   a. *Performance Activity - Identify a clay based soil.*
   b. *Performance Activity - Identify a sand based soil.*
   c. *Performance Activity - Identify a silt based soil.*
2. *Explain factors affecting soil classification.*
   a. *Test - Describe slope and drainage.*
   b. *Performance Activity - Determine slope and drainage.*

c. *Test - Describe permeability.*
d. *Performance Activity - Determine permeability.*
e. *Test - Describe texture.*
f. *Performance Activity - Determine texture.*
g. *Test - Describe depth of top soil.*
h. *Performance Activity - Determine depth of top soil.*

3. *Describe methods used in determining soil capability classes.*
   a. *Assignment - Apply soil capability classes to soil in local area.*
   b. *Performance Activity - Identify soils in the local area using county soil survey maps.*
4. *Apply procedures for collecting soil samples.*
   a. *Performance Activity - Collect a soil sample.*
   b. *Performance Activity - Analyze a soil sample for primary nutrients and pH.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

County Soil Survey Map.

Donohue, R. L. Our Soils and Their Management. (6th ed.). Danville, IL: Interstate. 1992.

Plaster, E. . Soil Science and Management. (2nd ed.). Albany, NY: Delmar. 1992.

AGRISCIENCE I
UNIT 11: NATURAL RESOURCES **(10 days)**

Competencies and Suggested Objectives:

1. Explain the importance of forestry in relation to man, wildlife, and water.
   a. Describe the importance of forestry in the local, county, and state economy.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Identify properties of wood.
   a. Describe wood hardness.
   b. Describe weight of wood.
   c. Describe the shrinkage of wood.
   d. Describe warping of wood.
   e. Describe wood working qualities.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Identify species of trees.
   a. Describe hardwoods.
   b. Describe softwoods.
   c. Collect leaves to determine species.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Identify principles of forest management.
   a. Describe management practices of growing a wood lot.
   b. Describe the planning of a harvest cutting.
   c. Describe the practices of woodlot protection.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

5. Identify the characteristics of selected species of wildlife.
   a. Describe vertebrates and invertebrates.
   b. Describe predators.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
6. Explain interdependency occurring within the wildlife community.
   a. Describe parasitism.
   b. Observe parasitism.
   c. Describe mutualism.
   d. Observe mutualism.
   e. Describe predation.
   f. Observe predation.
   g. Describe commensalism.
   h. Describe competition.
   i. Observe competition.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
7. Conduct contamination analyses.
   a. Test water, air, and soil for contaminants.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain the importance of forestry in relation to man, wildlife, and water.*
   a. *Written/oral report to describe the importance of forestry in the local, county, and state economy.*
2. *Identify properties of wood.*
   a. *Demonstrate wood hardness.*
   b. *Demonstrate weight of wood.*
   c. *Demonstrate the shrinkage of wood.*
   d. *Demonstrate warping of wood.*
   e. *Demonstrate wood working qualities.*

3. *Identify species of trees.*
   a. *Performance exercise to identify hardwoods.*
   b. *Performance exercise to identify softwoods.*
   c. *Performance exercise to collect leaves to determine species.*
4. *Identify principles of forest management.*
   a. *Written/oral report to describe management practices of growing a wood lot.*
   b. *Written/oral report to describe the planning of a harvest cutting.*
   c. *Written/oral report to describe the practices of woodlot protection.*
5. *Identify the characteristics of selected species of wildlife.*
   a. *Discussion and media on vertebrates and invertebrates.*
   b. *Discussion and media on predators.*
6. *Explain interdependency occurring within the wildlife community.*
   a. *Discussion and media on parasitism.*
   b. *Performance exercise to observe parasitism.*
   c. *Discussion and media on mutualism.*
   d. *Performance exercise to observe mutualism.*
   e. *Discussion and media on predation.*
   f. *Performance exercise to observe predation.*
   g. *Discussion and media on commensalism.*
   h. *Discussion and media on competition.*
   i. *Performance exercise to observe competition.*
7. *Conduct contamination analyses.*
   a. *Performance exercise to test water, air, and soil for contaminants.*

Suggested Assessment Strategies:

1. *Explain the importance of forestry in relation to man, wildlife, and water.*
   a. *Assignment - Describe the importance of forestry in the local, county, and state economy.*
2. *Identify properties of wood.*
   a. *Assignment - Describe wood hardness.*
   b. *Assignment - Describe weight of wood.*
   c. *Assignment - Describe the shrinkage of wood.*
   d. *Assignment - Describe warping of wood.*
   e. *Assignment - Describe wood working qualities.*
3. *Identify species of trees.*
   a. *Assignment - Describe hardwoods.*
   b. *Assignment - Describe softwoods.*
   c. *Performance Activity - Collect leaves to determine species.*
4. *Identify principles of forest management.*
   a. *Assignment - Describe management practices of growing a wood lot.*
   b. *Assignment - Describe the planning of a harvest cutting.*
   c. *Assignment - Describe the practices of woodlot protection.*

5. *Identify the characteristics of selected species of wildlife.*
   a. *Test - Describe vertebrates and invertebrates.*
   b. *Test - Describe predators.*
6. *Explain interdependency occurring within the wildlife community.*
   a. *Test - Describe parasitism.*
   b. *Performance Activity - Observe parasitism.*
   c. *Test - Describe mutualism.*
   d. *Performance Activity - Observe mutualism.*
   e. *Test - Describe predation.*
   f. *Performance Activity - Observe predation.*
   g. *Test - Describe commensalism.*
   h. *Test - Describe competition.*
   i. *Performance Activity - Observe competition.*
7. *Conduct contamination analyses.*
   a. *Performance Activity - Test water, air, and soil for contaminants.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Lytle, R. A. & Kircher, H. B. Investigations in Conservation of Natural Resources. Danville, IL: Interstate. 1993.

AGRISCIENCE I
UNIT 12: ENTOMOLOGY **(10 days)**

Competencies and Suggested Objectives:

1. The student will identify the external parts of an insect.
   a. Label the wings, legs, mouth, head, thorax, and antenna of an insect.
   b. Identify common agricultural pests according to stages of their life cycle.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain the functions of each major part of an insect.
   a. Describe the functions of insect wings.
   b. Describe the functions of the mouth parts including chewing and biting, piercing and sucking, siphoning, and sponging.
   c. Describe the functions of legs of an insect.
   d. Describe the functions of the head of an insect.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Collect specimens and classify them according to their characteristics.
   a. Classify according to sucking, piercing, siphoning, sponging, and chewing and biting mouth parts.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Apply an integrated pest management plan in the greenhouse.
   a. Develop an integrated pest management plan for use in the greenhouse.
   b. Implement an integrated pest management plan in the greenhouse.
   c. Evaluate an integrated pest management plan.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *The student will identify the external parts of an insect.*
   a. *Performance exercise to label the wings, legs, mouth, head, thorax and antenna of an insect.*
   b. *Performance exercise to identify common agricultural pests according to stages of their life cycle.*
2. *Explain the functions of each major part of an insect.*
   a. *Discussion and media on the functions of insect wings.*
   b. *Discussion and media on the functions of the mouth parts including chewing and biting, piercing and sucking, siphoning, and sponging.*
   c. *Discussion and media on the functions of legs of an insect.*
   d. *Discussion and media on the functions of the head of an insect.*
3. *Collect specimens and classify them according to their characteristics.*
   a. *Performance exercise to classify insects according to sucking, piercing, siphoning, sponging, and chewing and biting mouth parts.*
4. *Apply an integrated pest management plan in the greenhouse.*
   a. *Assist students to develop an integrated pest management plan for use in the greenhouse.*
   b. *Performance exercise to implement an integrated pest management plan in the greenhouse.*
   c. *Performance exercise to evaluate an integrated pest management plan.*

Suggested Assessment Strategies:

1. *The student will identify the external parts of an insect.*
   a. *Performance Activity - Label the wings, legs, mouth, head, thorax and antenna of an insect.*
   b. *Performance Activity - Identify common agricultural pests according to stages of their life cycle.*
2. *Explain the functions of each major part of an insect.*
   a. *Test - Describe the functions of insect wings.*
   b. *Test - Describe the functions of the mouth parts including chewing and biting, piercing and sucking, siphoning, and sponging.*
   c. *Test - Describe the functions of legs of an insect.*
   d. *Test - Describe the functions of the head of an insect.*
3. *Collect specimens and classify them according to their characteristics.*
   a. *Performance Activity - Classify according to sucking, piercing, siphoning, sponging, and chewing and biting mouth parts.*
4. *Apply an integrated pest management plan in the greenhouse.*
   a. *Assignment - Develop an integrated pest management plan for use in the greenhouse.*

b. *Performance Activity - Implement an integrated pest management plan in the greenhouse.*
c. *Performance Activity - Evaluate an integrated pest management plan.*

Suggested References:

Johnson, D. M. (Ed.) Agriscience Learning Activities Manual. Mississippi State University, MS: RCU. 1991.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

AGRISCIENCE I
UNIT 13: BIOTECHNOLOGY **(10 days)**

Competencies and Suggested Objectives:

1. Explain contributions which biotechnology makes to agriculture.
   a. Describe frost protection.
   b. Describe photosynthesis research.
   c. Describe disease resistance.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain the role of DNA and RNA in living creatures.
   a. Describe DNA.
   b. Describe RNA.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Identify methods of transferring genetic information.
   a. Describe gene splicing.
   b. Describe particle gun transformation.
   c. Describe tissue culture.
   d. Perform tissue culture.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain contributions which biotechnology makes to agriculture.*
   a. Discussion and media on frost protection.
   b. Written/oral report to describe photosynthesis research.
   c. Discussion and media on disease resistance.
2. *Explain the role of DNA and RNA in living creatures.*
   a. Discussion and media on DNA.
   b. Discussion and media on RNA.

3. *Identify methods of transferring genetic information.*
   a. *Discussion and media on gene splicing.*
   b. *Discussion and media on particle gun transformation.*
   c. *Discussion and media on tissue culture.*
   d. *Performance exercise to perform tissue culture.*

Suggested Assessment Strategies:

1. *Explain contributions which biotechnology makes to agriculture.*
   a. *Test - Describe frost protection.*
   b. *Assignment - Describe photosynthesis research.*
   c. *Test - Describe disease resistance.*
2. *Explain the role of DNA and RNA in living creatures.*
   a. *Test - Describe DNA.*
   b. *Test - Describe RNA.*
3. *Identify methods of transferring genetic information.*
   a. *Test - Describe gene splicing.*
   b. *Test - Describe particle gun transformation.*
   c. *Test - Describe tissue culture.*
   d. *Performance Activity - Perform tissue culture.*

Suggested References:

Burton, L. D. Agriscience and Technology. Albany, NY: Delmar. 1992.

Johnson, D. M. (Ed.) Agriscience Learning Activities Manual. Mississippi State University, MS: RCU. 1991.

Lee, J. S. and Turner, D. L. Introduction to World Agriscience and Technology. Danville, IL: Interstate. 1994.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

AGRISCIENCE I
UNIT 14: OPPORTUNITIES IN AGRISCIENCE (10 days)

Competencies and Suggested Objectives:

1. Explain terms related to agriscience career opportunities.
   a. Define terms related to agriscience career opportunities.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
2. Explain the opportunities for agriscience careers.
   a. Describe horticulture careers.
   b. Describe agriscience mechanics careers.
   c. Describe agriscience supplies and service careers.
   d. Describe forestry careers.
   e. Describe agriscience processing, products, and distribution careers.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
3. Identify educational requirements for agribusiness careers.
   a. Describe courses of study in middle and high schools.
   b. Describe programs of study in community colleges and universities.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
4. Set personal goals for career and development.
   a. Establish short- and long-range personal and career goals.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
5. Prepare for employment interview.
   a. Participate in a role-play interview.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Explain terms related to agriscience career opportunities.*
   a. *Discussion and media on terms related to agriscience career opportunities.*
2. *Explain the opportunities for agriscience careers.*
   a. *Written/oral report to describe horticulture careers.*
   b. *Written/oral report to describe agriscience mechanics careers.*
   c. *Written/oral report to describe agriscience supplies and service careers.*
   d. *Written/oral report to describe forestry careers.*
   e. *Written/oral report to describe agriscience processing, products, and distribution careers.*
3. *Identify educational requirements for agribusiness careers.*
   a. *Written/oral report to describe courses of study in middle and high schools and participate in career day programs.*
   b. *Written/oral report to describe programs of study in community colleges and universities and participate in career day programs.*
4. *Set personal goals for career and development.*
   a. *Written/oral report to establish short- and long-range personal and career goals.*
5. *Prepare for employment interview.*
   a. *Performance exercise to participate in a role-play interview.*

Suggested Assessment Strategies:

1. *Explain terms related to agriscience career opportunities.*
   a. *Test - Define terms related to agriscience career opportunities.*
2. *Explain the opportunities for agriscience careers.*
   a. *Assignment - Describe horticulture careers.*
   b. *Assignment - Describe agriscience mechanics careers.*
   c. *Assignment - Describe agriscience supplies and service careers.*
   d. *Assignment - Describe forestry careers.*
   e. *Assignment - Describe agriscience processing, products, and distribution careers.*
3. *Identify educational requirements for agribusiness careers.*
   a. *Assignment - Describe courses of study in middle and high schools.*
   b. *Assignment - Describe programs of study in community colleges and universities.*
4. *Set personal goals for career and development.*
   a. *Assignment - Establish short- and long-range personal and career goals.*
5. *Prepare for employment interview.*
   a. *Performance Activity - Participate in a role-play interview.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Lee, J. S. and Turner, D. L. Introduction to World Agriscience and Technology. Danville, IL: Interstate. 1994.

AGRISCIENCE II

AGRISCIENCE II
UNIT 1: COMMUNICATION SKILLS **(10 days)**

Competencies and Suggested Objectives:

1. Describe steps in preparing an oral presentation.
   a. Identify a topic in agriscience.
   b. Develop an outline.
   c. Collect data.
   d. Compile data.
   e. Draft speech.
   f. Prepare presentation.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
2. Apply basic principles of public speaking.
   a. Demonstrate principles of voice utilization.
   b. Demonstrate principles of stage presence.
   c. Demonstrate principles of composition of manuscript.
   d. Demonstrate principles of power of expression.
   e. Demonstrate principles of response to questions.
   f. Demonstrate principles of general effect.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6
3. Present a 6 to 8 minute speech on an agriscience topic.
   a. Prepare and present a 6 to 8 minute speech on an agriscience topic utilizing the basic principles of public speaking.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Describe steps in preparing an oral presentation.*
   a. Assist students to select a topic in agriscience.
   b. Assist students to develop an outline.
   c. Assist students to collect data.
   d. Assist students to compile data.

e. *Assist students to draft speech.*
f. *Assist students to prepare presentation.*

2. *Explain basic principles of public speaking.*
   a. *Assist students to demonstrate principles of voice utilization.*
   b. *Assist students to demonstrate principles of stage presence.*
   c. *Assist students to demonstrate principles of composition of manuscript.*
   d. *Assist students to demonstrate principles of power of expression.*
   e. *Assist students to demonstrate principles of response to questions.*
   f. *Assist students to demonstrate principles of general effect.*
3. *Present a 6 to 8 minute speech on an agriscience topic.*
   a. *Performance exercise to prepare and present a 6 to 8 minute speech on an agriscience topic utilizing the basic principles of public speaking and to participate in FFA speech contests.*

Suggested Assessment Strategies:

1. *Describe steps in preparing an oral presentation.*
   a. *Assignment - Identify a topic in agriscience.*
   b. *Assignment - Develop an outline.*
   c. *Assignment - Collect data.*
   d. *Assignment - Compile data.*
   e. *Assignment - Draft speech.*
   f. *Assignment - Prepare presentation.*
2. *Explain basic principles of public speaking.*
   a. *Assignment - Demonstrate principles of voice utilization.*
   b. *Assignment - Demonstrate principles of stage presence.*
   c. *Assignment - Demonstrate principles of composition of manuscript.*
   d. *Assignment - Demonstrate principles of power of expression.*
   e. *Assignment - Demonstrate principles of response to questions.*
   f. *Assignment - Demonstrate principles of general effect.*
3. *Present a 6 to 8 minute speech on an agriscience topic.*
   a. *Performance Activity - Prepare and present a 6 to 8 minute speech on an agriscience topic utilizing the basic principles of public speaking.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Instructional Materials Service. Exploring Career Opportunities in Agriculture. Catalog #1050. College Station, TX: Texas A&M University.

National FFA Organization. FFA Manual. Alexandria, VA: Author. 1995.

Patton, Bob and Harp, Keith. Vocational Agriculture I. Stillwater, OK: Oklahoma Department of Vocational and Technical Education. 1984.

AGRISCIENCE II
UNIT 2: SUPERVISED AGRICULTURAL EXPERIENCE (SAE) IN AGRISCIENCE **(15 days)**

Competencies and Suggested Objectives:

1. Continue SAE activities. (Ongoing)
   a. Continue to develop the SAE in Agriscience.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C6

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Maintain agricultural records for the SAE.
   a. Prepare income and expense records.
   b. Prepare inventory records
   c. Compute enterprise summaries.
   d. Maintain placement records.
   e. Summarize the SAE program.
   f. Maintain leadership activity records.
   g. Compute a net worth statement.
   h. Fill out proficiency award and State FFA degree applications.

   Related Academic Topics (See Appendix A):
   C1, C2, C4, C6
   M1, M7

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Continue SAE activities. (Ongoing)*
   a. Assist students to develop the SAE in Agriscience.
2. *Maintain agricultural records for the SAE.*
   a. Performance exercise to prepare income and expense records using ASIS.
   b. Performance exercise to prepare inventory records using ASIS.
   c. Performance exercise to compute enterprise summaries.
   d. Performance exercise to maintain placement records.
   e. Performance exercise to summarize the SAE program.
   f. Performance exercise to maintain leadership activity records.
   g. Performance exercise to compute a net worth statement.
   h. Assist students to fill out proficiency award and State FFA degree applications.

Suggested Assessment Strategies:

1. *Continue SAE activities. (Ongoing)*
   a. *Teacher monitored progress - Continue to develop the SAE in Agriscience.*
2. *Maintain agricultural records for the SAE.*
   a. *Performance Activity - Prepare income and expense records.*
   b. *Performance Activity - Prepare inventory records*
   c. *Performance Activity - Compute enterprise summaries.*
   d. *Performance Activity - Maintain placement records.*
   e. *Performance Activity - Summarize the SAE program.*
   f. *Performance Activity - Maintain leadership activity records.*
   g. *Performance Activity - Compute a net worth statement.*
   h. *Assignment - Fill out proficiency award and State FFA degree applications.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

National FFA Organization. FFA Proficiency Awards and Degree Software. Alexandria, VA: Author. Current edition.

AGRISCIENCE II
UNIT 3: ADVANCED BIOTECHNOLOGY **(25 days)**

Competencies and Suggested Objectives:

1. Explain terms associated with biotechnology.
   a. Define terms associated with biotechnology.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain the benefits of biotechnology.
   a. Describe the benefits of biotechnology to plants.
   b. Describe the benefits of biotechnology to animals and humans.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Explain concerns about biotechnology.
   a. Describe concerns about biotechnology.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Explain the environmental impact of biotechnology.
   a. Describe the environmental impact of biotechnology.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
5. Explain the regulatory control of biotechnology research and industry.
   a. Identify biotechnology regulatory agencies.
   b. Identify the product protection laws.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

6. Explain ethical issues impacting biotechnology.
   a. Describe ethical issues impacting biotechnology.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
7. Indicate the companies in the biotechnology industry.
   a. Identify dedicated biotechnology companies.
   b. Identify large diversified companies with biotechnology interests.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
8. Explain career opportunities in biotechnology.
   a. Describe sample work areas of biotechnology in agriculture.
   b. Describe biotechnology related work areas.
   c. Describe positions, salary ranges, and educational requirements for careers in biotechnology.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
9. Apply procedures of tissue culture.
   a. Conduct a tissue culture experiment.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain terms associated with biotechnology.*
   a. *Discussion and media on terms associated with biotechnology.*
2. *Explain the benefits of biotechnology.*
   a. *Discussion and media on the benefits of biotechnology to plants.*
   b. *Discussion and media on the benefits of biotechnology to animals and humans.*
3. *Explain concerns about biotechnology.*
   a. *Discussion and media on concerns about biotechnology.*

4. *Explain the environmental impact of biotechnology.*
   a. *Discussion and media on the environmental impact of biotechnology.*
5. *Explain the regulatory control of biotechnology research and industry.*
   a. *Written/oral report to identify biotechnology regulatory agencies.*
   b. *Written/oral report to identify the product protection laws.*
6. *Explain ethical issues impacting biotechnology.*
   a. *Discussion and media on ethical issues impacting biotechnology.*
7. *Indicate the companies in the biotechnology industry.*
   a. *Written/oral report to identify dedicated biotechnology companies.*
   b. *Written/oral report to identify large diversified companies with biotechnology interests.*
8. *Explain career opportunities in biotechnology.*
   a. *Written/oral report to describe sample work areas of biotechnology in agriculture.*
   b. *Written/oral report to describe biotechnology related work areas.*
   c. *Written/oral report to describe positions, salary ranges, and educational requirements for careers in biotechnology.*
9. *Apply procedures of tissue culture.*
   a. *Performance exercise to conduct a tissue culture experiment.*

Suggested Assessment Strategies:

1. *Explain terms associated with biotechnology.*
   a. *Test - Define terms associated with biotechnology.*
2. *Explain the benefits of biotechnology.*
   a. *Test - Describe the benefits of biotechnology to plants.*
   b. *Test - Describe the benefits of biotechnology to animals and humans.*
3. *Explain concerns about biotechnology.*
   a. *Test - Describe concerns about biotechnology.*
4. *Explain the environmental impact of biotechnology.*
   a. *Test - Describe the environmental impact of biotechnology.*
5. *Explain the regulatory control of biotechnology research and industry.*
   a. *Assignment - Identify biotechnology regulatory agencies.*
   b. *Assignment - Identify the product protection laws.*
6. *Explain ethical issues impacting biotechnology.*
   a. *Test - Describe ethical issues impacting biotechnology.*
7. *Indicate the companies in the biotechnology industry.*
   a. *Assignment - Identify dedicated biotechnology companies.*
   b. *Assignment - Identify large diversified companies with biotechnology interests.*
8. *Explain career opportunities in biotechnology.*
   a. *Assignment - Describe sample work areas of biotechnology in agriculture.*
   b. *Assignment - Describe biotechnology related work areas.*

c. *Assignment - Describe positions, salary ranges, and educational requirements for careers in biotechnology.*

9. *Apply procedures of tissue culture.*
   a. *Performance Activity - Conduct a tissue culture experiment.*

Suggested References:

Burton, L. D. Agriscience and Technology. Albany, NY: Delmar. 1992.

Johnson, D. M. (Ed.) Agriscience Learning Activities Manual. Mississippi State University, MS: RCU. 1991.

Lee, J. S. and Turner, D. L. Introduction to World Agriscience and Technology. Danville, IL: Interstate. 1994.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

Peterson, D. R. and Rehberger, T. Biotechnology in Agriculture. Stillwater, OK: MAVCC. 1992.

AGRISCIENCE II
UNIT 4: FOOD SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Explain nutritional needs of humans and their functions.
   a. Describe the function of fat in human nutrition.
   b. Describe the function of proteins in human nutrition.
   c. Describe the function of carbohydrates in human nutrition.
   d. Describe the function of vitamins in human nutrition.
   e. Describe the function of minerals in human nutrition.
   f. Describe the function of water in human nutrition.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain the food groups which provide the essential nutritional requirements for human nutrition.
   a. Describe the essential nutrients provided by the food groups according to the Food Pyramid.
   b. Describe the essential nutrients provided by the bread and cereal group.
   c. Describe the essential nutrients provided by the milk and cheese group.
   d. Describe the essential nutrients provided by the meat, fish, poultry, and bean group.
   e. Describe the essential nutrients provided by the fats and sweets group.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Explain food customs around the world.
   a. Describe food customs around the world.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Apply processes of making yogurt.
   a. Culture bacteria to make yogurt.
   b. Analyze helpful and harmful bacteria.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4, C5
S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain nutritional needs of humans and their functions.*
   a. *Discussion and media on the function of fat in human nutrition.*
   b. *Discussion and media on the function of proteins in human nutrition.*
   c. *Discussion and media on the function of carbohydrates in human nutrition.*
   d. *Discussion and media on the function of vitamins in human nutrition.*
   e. *Discussion and media on the function of minerals in human nutrition.*
   f. *Discussion and media on the function of water in human nutrition.*
2. *Explain the food groups which provide the essential nutritional requirements for human nutrition.*
   a. *Discussion and media on the essential nutrients provided by the food groups according to the Food Pyramid.*
   b. *Discussion and media on the essential nutrients provided by the bread and cereal group.*
   c. *Discussion and media on the essential nutrients provided by the milk and cheese group.*
   d. *Discussion and media on the essential nutrients provided by the meat, fish, poultry, and bean group.*
   e. *Discussion and media on the essential nutrients provided by the fats and sweets group.*
3. *Explain food customs around the world.*
   a. *Written/oral report to describe food customs around the world.*
4. *Apply processes of making yogurt.*
   a. *Performance exercise to culture bacteria to make yogurt.*
   b. *Performance exercise to analyze helpful and harmful bacteria.*

Suggested Assessment Strategies:

1. *Explain nutritional needs of humans and their functions.*
   a. *Test - Describe the function of fat in human nutrition.*
   b. *Test - Describe the function of proteins in human nutrition.*
   c. *Test - Describe the function of carbohydrates in human nutrition.*
   d. *Test - Describe the function of vitamins in human nutrition.*
   e. *Test - Describe the function of minerals in human nutrition.*
   f. *Test - Describe the function of water in human nutrition.*

2. *Explain the food groups which provide the essential nutritional requirements for human nutrition.*
   a. *Test - Describe the essential nutrients provided by the food groups in the Food Pyramid.*
   b. *Test - Describe the essential nutrients provided by the bread and cereal group.*
   c. *Test - Describe the essential nutrients provided by the milk and cheese group.*
   d. *Test - Describe the essential nutrients provided by the meat, fish, poultry, and bean group.*
   e. *Test - Describe the essential nutrients provided by the fats and sweets group.*
3. *Explain food customs around the world.*
   a. *Assignment - Describe food customs around the world.*
4. *Apply processes of making yogurt.*
   a. *Performance Activity - Culture bacteria to make yogurt.*
   b. *Performance Activity - Analyze helpful and harmful bacteria.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

AGRISCIENCE II
UNIT 5: ADVANCED PLANT SCIENCE **(15 days)**

Competencies and Suggested Objectives:

1. Define terms associated with hydroponics.
   a. Describe media, medium, hydroponics, amendment, pH, acidity, alkalinity, neutral, primary nutrients, complete fertilizer, starter solutions, water culture, and aquaculture.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Identify requirements for hydroponics plant production.
   a. Describe the requirements for water, oxygen, mineral nutrients, light, spacing, temperature, and support.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Explain types of hydroponics systems.
   a. Describe the aggregate culture hydroponics system.
   b. Describe the water culture hydroponics system.
   c. Describe the aeroponics hydroponics system.
   d. Describe the continuous flow hydroponics system.
   e. Build a hydroponic system.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Apply greenhouse management.
   a. Demonstrate insect control.
   b. Demonstrate disease control.
   c. Demonstrate watering systems.
   d. Demonstrate utilization of space.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4, C5
   S3, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

5. Explain procedures to apply for a restricted pest management permit.
   a. Apply for a restricted pest management permit.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4, C5
S3, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Define terms associated with hydroponics.*
   a. *Discussion and media on terms, such as media, medium, hydroponics, amendment, pH, acidity, alkalinity, neutral, primary nutrients, complete fertilizer, starter solutions, water culture, and aquaculture.*
2. *Identify requirements for hydroponics plant production.*
   a. *Discussion and media on the requirements for water, oxygen, mineral nutrients, light, spacing, temperature, and support.*
3. *Explain types of hydroponics systems.*
   a. *Written/oral report to describe the aggregate culture hydroponics system.*
   b. *Written/oral report to describe the water culture hydroponics system.*
   c. *Written/oral report to describe the aeroponics hydroponics system.*
   d. *Written/oral report to describe the continuous flow hydroponics system.*
   e. *Performance exercise to build a hydroponic system.*
4. *Apply greenhouse management.*
   a. *Performance exercise to demonstrate insect control.*
   b. *Performance exercise to demonstrate disease control.*
   c. *Performance exercise to demonstrate watering systems.*
   d. *Performance exercise to demonstrate utilization of space.*
5. *Explain procedures to apply for a restricted pest management permit.*
   a. *Assist students to apply for a restricted pest management permit.*

Suggested Assessment Strategies:

1. *Define terms associated with hydroponics.*
   a. *Test - Describe media, medium, hydroponics, amendment, pH, acidity, alkalinity, neutral, primary nutrients, complete fertilizer, starter solutions, water culture, and aquaculture.*
2. *Identify requirements for hydroponics plant production.*
   a. *Test - Describe the requirements for water, oxygen, mineral nutrients, light, spacing, temperature, and support.*
3. *Explain types of hydroponics systems.*
   a. *Assignment - Describe the aggregate culture hydroponics system.*
   b. *Assignment - Describe the water culture hydroponics system.*
   c. *Assignment - Describe the aeroponics hydroponics system.*

d. Assignment - Describe the continuous flow hydroponics system.
e. Performance Activity - Build a hydroponics system.

4. Apply greenhouse management.
a. Performance Activity - Demonstrate insect control.
b. Performance Activity - Demonstrate disease control.
c. Performance Activity - Demonstrate watering systems.
d. Performance Activity - Demonstrate utilization of space.

5. Explain procedures to apply for a restricted pest management permit.
a. Assignment - Apply for a restricted pest management permit.

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

Towle, A. Modern Biology. Albany, NY: Holt, Rinehart, and Winston. 1989.

AGRISCIENCE II
UNIT 6: ADVANCED SOIL SCIENCE **(15 days)**

Competencies and Suggested Objectives:

1. Explain functions of soil nutrients in plant growth.
   a. Describe macro nutrients.
   b. Describe micro nutrients.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S5, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Determine soil nutrients present in soil samples.
   a. Identify macro nutrients.
   b. Identify micro nutrients.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S5, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Perform soil testing and interpret results.
   a. Conduct a soil test for pH, N, P, and K.
   b. Interpret the soil test results.
   c. Prepare fertilizer recommendations.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S5, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Interpret soil analysis survey.
   a. Collect and send soil sample for analysis.
   b. Analyze results.
   c. Make recommendations.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S5, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain functions of soil nutrients in plant growth.*
   a. *Discussion and media on macro nutrients.*
   b. *Discussion and media on micro nutrients.*
2. *Determine soil nutrients present in soil samples.*
   a. *Discussion and media on macro nutrients.*
   b. *Discussion and media on micro nutrients.*
3. *Perform soil testing and interpret results.*
   a. *Performance exercise to conduct a soil test for pH, N, P, and K.*
   b. *Performance exercise to interpret the soil test results.*
   c. *Performance exercise to prepare fertilizer recommendations.*
4. *Interpret soil analysis survey.*
   a. *Performance exercise to collect and send soil sample for analysis.*
   b. *Performance exercise to analyze results.*
   c. *Performance exercise to make recommendations.*

Suggested Assessment Strategies:

1. *Explain functions of soil nutrients in plant growth.*
   a. *Test - Describe macro nutrients.*
   b. *Test - Describe micro nutrients.*
2. *Determine soil nutrients present in soil samples.*
   a. *Test - Identify macro nutrients.*
   b. *Test - Identify micro nutrients.*
3. *Perform soil testing and interpret results.*
   a. *Performance Activity - Conduct a soil test for pH, N, P, and K.*
   b. *Performance Activity - Interpret the soil test results.*
   c. *Performance Activity - Prepare fertilizer recommendations.*
4. *Interpret soil analysis survey.*
   a. *Performance Activity - Collect and send soil sample for analysis.*
   b. *Performance Activity - Analyze results.*
   c. *Performance Activity - Make recommendations.*

Suggested References:

Buriak, P. & Osborne, E. W. Physical Science Applications in Agriculture. Danville, IL: Interstate. 1995.

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

County Soil Survey Map.

Donohue, R. L. Our Soils and Their Management (6th ed.). Danville, IL: Interstate. 1992.

Plaster, E. Soil Science and Management (2nd ed.). Albany, NY: Delmar. 1992.

102

AGRISCIENCE II
UNIT 7: ENVIRONMENTAL SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Identify major components of air.
   a. Describe the major components of air related to plant and animal life.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   M4, M7
   S4, S5, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Describe the importance of air quality as it relates to humans and other living organisms.
   a. Analyze the importance of air quality as it relates to humans and other living organisms.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   M4, M7
   S4, S5, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Identify common threats to air quality.
   a. Describe loss of air quality as a result of sulphur.
   b. Describe loss of air quality as a result of hydrocarbons.
   c. Describe loss of air quality as a result of nitrous oxides and lead.
   d. Describe loss of air quality as a result of carbon monoxide.
   e. Describe loss of air quality as a result of radon.
   f. Describe loss of air quality as a result of radioactive dust and materials.
   g. Describe loss of air quality as a result of chlorofluorocarbons.
   h. Describe loss of air quality as a result of pesticide and spray materials.
   i. Describe loss of air quality as a result of asbestos.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   M4, M7
   S4, S5, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Explain practices to reduce air pollution.
   a. Describe practices to reduce air pollution.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

5. Identify terms related to environmental quality.
   a. Define terms related to air quality, water quality, and soil quality.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

6. Cite important relationships between land characteristics and water quality.
   a. Describe precipitation.
   b. Describe land as a reservoir.
   c. Describe types of ground water.
   d. Describe benefits of living organisms.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

7. Explain major threats to water quality.
   a. Describe major threats to water quality.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

8. Test local water system for possible contamination.
   a. Analyze results of local water system tests.

Related Academic Topics (See Appendix A):
C1, C2, C3, C4
M4, M7
S4, S5, S8
Workplace Skills (See Appendix B):
WP1, WP2, WP4, WP6

9. Plan an experiment to determine the effect of soil water on plant growth.
   a. Design and conduct an experiment to determine the effect of soil water on plant growth.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4
M4, M7
S4, S5, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

10. Design and construct a project to demonstrate concepts of erosion control.
    a. Demonstrate the effects of the force of raindrops on soils.
    b. Demonstrate the effects of the soil aggregation on absorption.
    c. Demonstrate the effects of slope on erosion.
    d. Demonstrate the effects of living grass on erosion control.
    e. Demonstrate the effects of plant residue on erosion control.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4
M4, M7
S4, S5, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Identify major components of air.*
    a. *Discussion and media on the major components of air related to plant and animal life.*
2. *Describe the importance of air quality as it relates to humans and other living organisms.*
    a. *Discussion and media on the importance of air quality as it relates to humans and other living organisms.*
3. *Identify common threats to air quality.*
    a. *Written/oral report to describe loss of air quality as a result of sulphur.*
    b. *Written/oral report to describe loss of air quality as a result of hydrocarbons.*
    c. *Written/oral report to describe loss of air quality as a result of nitrous oxides and lead.*
    d. *Written/oral report to describe loss of air quality as a result of carbon monoxide.*
    e. *Written/oral report to describe loss of air quality as a result of radon.*
    f. *Written/oral report to describe loss of air quality as a result of radioactive dust and materials.*
    g. *Written/oral report to describe loss of air quality as a result of chlorofluorocarbons.*
    h. *Written/oral report to describe loss of air quality as a result of pesticide and spray materials.*
    i. *Written/oral report to describe loss of air quality as a result of asbestos.*

4. *Explain practices to reduce air pollution.*
   a. *Written/oral report to describe practices to reduce air pollution.*
5. *Identify terms related to environmental quality.*
   a. *Discussion and media on terms related to air quality, water quality, and soil quality.*
6. *Cite important relationships between land characteristics and water quality.*
   a. *Discussion and media on precipitation.*
   b. *Discussion and media on land as a reservoir.*
   c. *Discussion and media on types of ground water.*
   d. *Discussion and media on benefits of living organisms.*
7. *Explain major threats to water quality.*
   a. *Written/oral report to describe major threats to water quality.*
8. *Test local water system for possible contamination.*
   a. *Performance exercise to analyze results of local water system tests.*
9. *Plan an experiment to determine the effect of soil water on plant growth.*
   a. *Performance exercise to design and conduct an experiment to determine the effect of soil water on plant growth.*
10. *Design and construct a project to demonstrate concepts of erosion control.*
    a. *Performance exercise to demonstrate the effects of the force of raindrops on soils.*
    b. *Performance exercise to demonstrate the effects of the soil aggregation on absorption.*
    c. *Performance exercise to demonstrate the effects of slope on erosion.*
    d. *Performance exercise to demonstrate the effects of living grass on erosion control.*
    e. *Performance exercise to demonstrate the effects of plant residue on erosion control.*

Suggested Assessment Strategies:

1. *Identify major components of air.*
   a. *Test - Describe the major components of air related to plant and animal life.*
2. *Describe the importance of air quality as it relates to humans and other living organisms.*
   a. *Test - Analyze the importance of air quality as it relates to humans and other living organisms.*
3. *Identify common threats to air quality.*
   a. *Assignment - Describe loss of air quality as a result of sulphur.*
   b. *Assignment - Describe loss of air quality as a result of hydrocarbons.*
   c. *Assignment - Describe loss of air quality as a result of nitrous oxides and lead.*
   d. *Assignment - Describe loss of air quality as a result of carbon monoxide.*
   e. *Assignment - Describe loss of air quality as a result of radon.*

f. *Assignment - Describe loss of air quality as a result of radioactive dust and materials.*
g. *Assignment - Describe loss of air quality as a result of chlorofluorocarbons.*
h. *Assignment - Describe loss of air quality as a result of pesticide and spray materials.*
i. *Assignment - Describe loss of air quality as a result of asbestos.*

4. *Explain practices to reduce air pollution.*
   a. *Assignment - Describe practices to reduce air pollution.*
5. *Identify terms related to environmental quality.*
   a. *Test - Define terms related to air quality, water quality, and soil quality.*
6. *Cite important relationships between land characteristics and water quality.*
   a. *Test - Describe precipitation.*
   b. *Test - Describe land as a reservoir.*
   c. *Test - Describe types of ground water.*
   d. *Test - Describe benefits of living organisms.*
7. *Explain major threats to water quality.*
   a. *Assignment - Describe major threats to water quality.*
8. *Test local water system for possible contamination.*
   a. *Performance Activity - Analyze results of local water system tests.*
9. *Plan an experiment to determine the effect of soil water on plant growth.*
   a. *Performance Activity - Design and conduct an experiment to determine the effect of soil water on plant growth.*
10. *Design and construct a project to demonstrate concepts of erosion control.*
    a. *Performance Activity - Demonstrate the effects of the force of raindrops on soils.*
    b. *Performance Activity - Demonstrate the effects of the soil aggregation on absorption.*
    c. *Performance Activity - Demonstrate the effects of slope on erosion.*
    d. *Performance Activity - Demonstrate the effects of living grass on erosion control.*
    e. *Performance Activity - Demonstrate the effects of plant residue on erosion control.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

County Soil Survey Map.

Donohue, R. L. Our Soils and Their Management (6th ed.). Danville, IL: Interstate. 1992.

Lytle, R. A. & Kircher, H. B. Investigations in Conservation of Natural Resources. Danville, IL: Interstate. 1993.

Plaster, E. Soil Science and Management (2nd ed.). Albany, NY: Delmar. 1992.

AGRISCIENCE II
UNIT 8: AQUACULTURE **(10 days)**

Competencies and Suggested Objectives:

1. Explain terms associated with aquaculture.
   a. Define terms associated with aquaculture.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S2, S3, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain the aquaculture food chain.
   a. Describe the role of plants in the aquaculture food chain.
   b. Describe the role of microbes in the aquaculture food chain.
   c. Describe the role of fish in the aquaculture food chain.
   d. Describe the role of insects in the aquaculture food chain.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S2, S3, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Explain the major aquaculture production systems.
   a. Describe caged culture.
   b. Describe recirculating tanks.
   c. Describe hatcheries.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S2, S3, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Plan a small-scale aquaculture production system.
   a. Develop a small-scale aquaculture production system.
   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   M1, M4, M7
   S2, S3, S8
   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain terms associated with aquaculture.*
   a. *Discussion and media on terms associated with aquaculture.*
2. *Explain the aquaculture food chain.*
   a. *Written/oral report to describe the role of plants in the aquaculture food chain.*
   b. *Written/oral report to describe the role of microbes in the aquaculture food chain.*
   c. *Written/oral report to describe the role of fish in the aquaculture food chain.*
   d. *Written/oral report to describe the role of insects in the aquaculture food chain.*
3. *Explain the major aquaculture production systems.*
   a. *Written/oral report to describe caged culture.*
   b. *Written/oral report to describe recirculating tanks.*
   c. *Written/oral report to describe hatcheries.*
4. *Plan a small-scale aquaculture production system.*
   a. *Performance exercise to develop a small-scale aquaculture production system.*

Suggested Assessment Strategies:

1. *Explain terms associated with aquaculture.*
   a. *Test - Define terms associated with aquaculture.*
2. *Explain the aquaculture food chain.*
   a. *Assignment - Describe the role of plants in the aquaculture food chain.*
   b. *Assignment - Describe the role of microbes in the aquaculture food chain.*
   c. *Assignment - Describe the role of fish in the aquaculture food chain.*
   d. *Assignment - Describe the role of insects in the aquaculture food chain.*
3. *Explain the major aquaculture production systems.*
   a. *Assignment - Describe caged culture.*
   b. *Assignment - Describe recirculating tanks.*
   c. *Assignment - Describe hatcheries.*
4. *Plan a small-scale aquaculture production system.*
   a. *Performance Activity - Develop a small-scale aquaculture production system.*

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Lee, J. S. & Newman, M. E. Acquaculture: An Introduction. Danville, IL: Interstate. 1992.

AGRISCIENCE II
UNIT 9: ADVANCED ANIMAL SCIENCE **(10 days)**

Competencies and Suggested Objectives:

1. Explain terms related to advanced animal science.
   a. Define terms related to advanced animal science.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S3, S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
2. Explain how animal traits are passed on to offspring and which traits are best transferred.
   a. Describe chromosomes.
   b. Describe desirable characteristics.
   c. Describe heredity.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S3, S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
3. Explain growth promoters for animals.
   a. Describe how supplements promote growth.
   b. Describe growth promoter implants.
   c. Describe the effects of antibiotic feed additives.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   S3, S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
4. Explain the need and methods for checking the vital signs.
   a. Describe heart rate and body temperature of different species of animals.
   b. Demonstrate procedures for checking vital signs.

   Related Academic Topics (See Appendix A):
   C1, C2, C3, C4
   M1, M4, M7
   S3, S7, S8

   Workplace Skills (See Appendix B):
   WP1, WP2, WP4, WP6
5. Explain the need for and processes of artificial insemination in animals.
   a. Describe the processes used and the need for artificial insemination in animal science.

b. Perform the processes used in artificial insemination of livestock.
c. Observe procedures for embryo transfer.

Related Academic Topics (See Appendix A):

C1, C2, C3, C4
S3, S7, S8

Workplace Skills (See Appendix B):

WP1, WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Explain terms related to advanced animal science.*
   a. *Discussion and media on terms related to advanced animal science.*
2. *Explain how animal traits are passed on to offspring and which traits are best transferred.*
   a. *Discussion and media on chromosomes.*
   b. *Discussion and media on desirable characteristics.*
   c. *Discussion and media on heredity.*
3. *Explain growth promoters for animals.*
   a. *Discussion and media on how supplements promote growth.*
   b. *Discussion and media on growth promoter implants.*
   c. *Discussion and media on the effects of antibiotic feed additives.*
4. *Explain the need and methods for checking the vital signs.*
   a. *Written/oral report to describe heart rate and body temperature of different species of animals.*
   b. *Performance exercise to demonstrate procedures for checking vital signs.*
5. *Explain the need for and processes of artificial insemination in animals.*
   a. *Written/oral report to describe the processes used and the need for artificial insemination in animal science.*
   b. *Performance exercise to observe/perform the processes used in artificial insemination of livestock.*
   c. *Arrange for a demonstration of procedures for embryo transfer.*

Suggested Assessment Strategies:

1. *Explain terms related to advanced animal science.*
   a. *Test - Define terms related to advanced animal science.*
2. *Explain how animal traits are passed on to offspring and which traits are best transferred.*
   a. *Test - Describe chromosomes.*
   b. *Test - Describe desirable characteristics.*
   c. *Test - Describe heredity.*
3. *Explain growth promoters for animals.*
   a. *Test - Describe how supplements promote growth.*
   b. *Test - Describe growth promoter implants.*

c. Test - Describe the effects of antibiotic feed additives.

4. *Explain the need and methods for checking the vital signs.*
   a. Assignment - Describe heart rate and body temperature of different species of animals.
   b. Performance Activity - Perform procedures for checking vital signs.
5. *Explain the need for and processes of artificial insemination in animals.*
   a. Assignment - Describe the processes used and the need for artificial insemination in animal science.
   b. Performance Activity - Perform the processes used in artificial insemination of livestock.
   c. Assignment - Observe procedures for embryo transfer.

Suggested References:

Cooper, Elmer. Agriscience: Fundamentals and Applications. Albany, NY: Delmar. 1990.

Ensminger, E. E. Animal Science. (9th ed.). Danville, IL: Interstate. 1992.

Gillespie, J. R. Modern Livestock and Poultry Production (4th ed.). Albany, NY: Delmar. 1992.

Osborne, E. W. Biological Science Applications in Agriculture. Danville, IL: Interstate. 1994.

SECTION III:

RECOMMENDED TOOLS AND EQUIPMENT

RECOMMENDED TOOLS AND EQUIPMENT FOR AGRISCIENCE
(Quantities for a class of 20 students)

1. African violet culture kit (1)
2. Air pollution sampling pump (battery powered) (1)
3. Air pollution study kit (2)
4. Apron, lab (20)
5. Aquaculture system, complete recirculating (1)
6. Aquarium, 20-30 gallon (unless larger aquaculture tanks are purchased) (1)
7. Autoclave (Optional) (1)
8. Balance, triple beam (1)
9. Blender, food (1)
10. Bottle, narrow necked w/cork stopper (10)
11. Bowl, mixing (1)
12. Brooder (1)
13. Cabinet and sanitizer (for goggles) (1)
14. Cabinet (for hazardous chemicals) (1)
15. Cabinet, storage (4)
16. Calculator (10)
17. Centrifuge (Optional) (1)
18. Colorimeter (Optional, replace with spectrophotometer) (1)
19. Computer w/internal modem, CD-ROM drive, color monitor (SDE specs) (10)
20. Dehydrator (1)
21. Dissecting kit (10)
22. Dissecting pan (10)
23. Dividers (10)
24. Engraving tool (1)
25. Eye wash station installed on waterline) (1)
26. First aid kit (adequate for 20 students) (1)
27. Gauge, feeler (5)
28. Gloves, rubber (100 pair)
29. Goggle, splash type (20)
30. Graduated cylinder, 25 ml (4)
31. Greenhouse, 20'x 30' w/drip pads, fans, heaters, and irrigation system (1)
32. Ground water simulation (1)
33. Hot plate (or electric skillet--some heat source is needed) (1)
34. Increment borer (1)
35. Incubator, culture (1)
36. Incubator, egg (may replace with one large incubator in poultry areas) (2)
37. Lab equipment set (1)
38. Laminar flow cabinet (may replace with culture cabinet) (1)
39. Mat, propagation (1)
40. Meter, pH (1)

41. Meter, light (1)
42. Meter, dissolved oxygen (necessary w/aquaculture system) (1)
43. Microcomputer based laboratory w/probes for temperature, motion, and light (1)
44. Micrometers, outside (5)
45. Microscope, student, stereomicroscope, binocular (2x to 4x) (5)
46. Microscope, student binocular (10x to 45x) (5)
47. Microwave (1)
48. Nematode study kits (2)
49. Net, insect (5)
50. Petri dishes w/cover, plastic disposable (100)
51. Pipette stand w/clamps (5)
52. Plant benches (10)
53. Plant flats (100)
54. Plant tissue culture kit (1)
55. Plant tissue test kit (1)
56. Plastic cups, thermal insulated w/tops, 32 oz (5)
57. Printer (5)
58. Pulley, double (2)
59. Pulley, single (2)
60. Pulley, triple (2)
61. Refrigerator, 21 cu. ft. minimum (1)
62. Respirator, chemical (5)
63. Rule, pocket (1/32" and 1/64" graduations) (10)
64. Scale, electronic balance (1)
65. Scale, spring (1)
66. Shade cloth (1)
67. Slide, microscope (100)
68. Small gas engine tool kit (Briggs & Stratton) (5)
69. Small gas engines (Briggs & Stratton, 3-5 hp) (5)
70. Soil tube sampler, 36" w/step (1)
71. Soil test kit, comprehensive (5)
72. Spectrophotometer, digital (Optional, may replace with colorimeter) (1)
73. Sprayer, 3 gal (1)
74. Stool, metal (20)
75. Syringe, 3 cc (10)
76. Syringe, 60 cc (10)
77. Table, student laboratory (6)
78. Tank, artificial insemination (Optional, only if live insemination is conducted) (1)
79. Tape measure (10)
80. Terrarium, plant (1)
81. Thermometer (5)
82. Tissue culture cabinet or incubator (1)

83. Titration burette, 50 ml (4)
84. Trap, insect (1)
85. Tree scale stick (5)
86. Voltmeter, triple range (5)
87. Water pollution detection kit (Lamotte)(Aquaculture--Replace with Hach Farm Pond Test Kit) (1)
88. Wheelbarrow, 6 cu. ft. (1)
89. Wisconsin fast plants light system (1)
90. Wisconsin fast plants classroom growth & development kit (3)

SUGGESTED INSTRUCTIONAL AIDS

1. Agricultural Satellite Information System (ASIS) (1)
2. Camcorder w/tripod and carrying case (1)
3. Cart, AV (for TV-VCR) (1)
4. Cart, AV (for overhead projector) (1)
5. Computer LCD display panel (to show computer on overhead projector) (1)
6. Digital camera (for use with micro video system) (1)
7. Micro video system (1)
8. Overhead projector (high intensity for use with LCD panel) (1)
9. Phone service for Internet connection (1)
10. Microscope, teaching, stereomicroscope (2 eyepieces, teaching microscope, light enclosed) (1)
11. Microscope, advanced teaching, trinocular (10x to 100x, oil immersion) (1)
12. TV-VCR (1)
13. Video out (Microcomputer to TV monitor) (1)

APPENDIX A:

RELATED ACADEMIC TOPICS

APPENDIX A

RELATED ACADEMIC TOPICS FOR COMMUNICATIONS

C1 Interpret written material.
C2 Interpret visual materials (maps, charts, graphs, tables, etc.).
C3 Listen, comprehend, and take appropriate actions.
C4 Access, organize, and evaluate information.
C5 Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.
C6 Communicate ideas and information effectively using various oral and written forms for a variety of audiences and purposes.

EXPANDED TOPICS FOR COMMUNICATIONS

TOPIC 1: Interpret written material.

C1.01 Read and follow complex written directions.
C1.02 Recognize common words and meanings associated with a variety of occupations.
C1.03 Adjust reading strategy to purpose and type of reading.
C1.04 Use sections of books and reference sources to obtain information.
C1.05 Compare information from multiple sources and check validity.
C1.06 Interpret items and abbreviations used in multiple forms.
C1.07 Interpret short notes, memos, and letters.
C1.08 Comprehend technical words and concepts.
C1.09 Use various reading techniques depending on purpose for reading.
C1.10 Find, read, understand, and use information from printed matter or electronic sources.

TOPIC 2: Interpret visual materials (maps, charts, graphs, tables, etc.).

C2.01 Use visuals in written and in oral presentations.
C2.02 Recognize visual cues to meaning (layout, typography, etc.).
C2.03 Interpret and apply information using visual materials.

TOPIC 3: Listen, comprehend, and take appropriate action.

C3.01 Identify and evaluate orally-presented messages according to purpose.
C3.02 Recognize barriers to effective listening.
C3.03 Recognize how voice inflection changes meaning.
C3.04 Identify speaker signals requiring a response and respond accordingly.
C3.05 Listen attentively and take accurate notes.
C3.06 Use telephone to receive information.

C3.07 Analyze and distinguish information from formal and informal oral presentations.

TOPIC 4: Access, organize, and evaluate information.

C4.01 Distinguish fact from opinion.
C4.02 Use various print and non-print sources for specialized information.
C4.03 Interpret and distinguish between literal and figurative meaning.
C4.04 Interpret written or oral communication in relation to context and writer's point of view.
C4.05 Use relevant sources to gather information for written or oral communication.

TOPIC 5: Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.

C5.01 Select appropriate words for communication needs.
C5.02 Use reading, writing, listening, and speaking skills to solve problems.
C5.03 Compose inquiries and requests.
C5.04 Write persuasive letters and memos.
C5.05 Edit written reports, letters, memos, and short notes for clarity, correct grammar, and effective sentences.
C5.06 Write logical and understandable statements, phrases, or sentences for filling out forms, for correspondence or reports.
C5.07 Write directions or summaries of processes, mechanisms, events, or concepts.
C5.08 Select and use appropriate formats for presenting reports.
C5.09 Convey information to audiences in writing.
C5.10 Compose technical reports and correspondence that meet accepted standards for written communications.

TOPIC 6: Communicate ideas and information using oral and written forms for a variety of audiences and purposes.

C6.01 Give complex oral instructions.
C6.02 Describe a business or industrial process/mechanism.
C6.03 Participate effectively in group discussions and decision making.
C6.04 Produce effective oral messages utilizing different media.
C6.05 Explore ideas orally with partners.
C6.06 Participate in conversations by volunteering information when appropriate and asking relevant questions when appropriate.
C6.07 Restate or paraphrase a conversation to confirm one's own understanding.
C6.08 Gather and provide information utilizing different media.

C6.09 Prepare and deliver persuasive, descriptive, and demonstrative oral presentations.

RELATED ACADEMIC TOPICS FOR MATHEMATICS

M1 Relate number relationships, number systems, and number theory.
M2 Explore patterns and functions.
M3 Explore algebraic concepts and processes.
M4 Explore the concepts of measurement.
M5 Explore the geometry of one-, two-, and three-dimensions.
M6 Explore concepts of statistics and probability in real world situations.
M7 Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

EXPANDED TOPICS FOR MATHEMATICS

TOPIC M1: Relate number relationships, number systems, and number theory.

M1.01 Understand, represent, and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and scientific notation) in real world and mathematical problem situations.
M1.02 Develop number sense for whole numbers, fractions, decimals, integers, and rational numbers.
M1.03 Understand and apply ratios, proportions, and percents in a wide variety of situations.
M1.04 Investigate relationships among fractions, decimals, and percents.
M1.05 Compute with whole numbers, fractions, decimals, integers, and rational numbers.
M1.06 Develop, analyze, and explain procedures for computation and techniques for estimations.
M1.07 Select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.
M1.08 Use computation, estimation, and proportions to solve problems.
M1.09 Use estimation to check the reasonableness of results.

TOPIC M2: Explore patterns and functions.

M2.01 Describe, extend, analyze, and create a wide variety of patterns.
M2.02 Describe and represent relationships with tables, graphs, and rules.
M2.03 Analyze functional relationships to explain how a change in one quantity results in a change in another.
M2.04 Use patterns and functions to represent and solve problems.
M2.05 Explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations.

M2.06 Use a mathematical idea to further their understanding of other mathematical ideas.
M2.07 Apply mathematical thinking and modeling to solve problems that arise in other disciplines, such as art, music, and business.

TOPIC M3: Explore algebraic concepts and processes.

M3.01 Represent situations and explore the interrelationships of number patterns with tables, graphs, verbal rules, and equations.
M3.02 Analyze tables and graphs to identify properties and relationships and to interpret expressions and equations.
M3.03 Apply algebraic methods to solve a variety of real world and mathematical problems.

TOPIC M4: Explore the concepts of measurement.

M4.01 Estimate, make,and use measurements to describe and compare phenomena.
M4.02 Select appropriate units and tools to measure to the degree of accuracy required in a particular situation.
M4.03 Extend understanding of the concepts of perimeter, area, volume, angle measure, capacity, and weight and mass.
M4.04 Understand and apply reasoning processes, with special attention to spatial reasoning and reasoning with proportions and graphs.

TOPIC M5: Explore the geometry of one-, two-, and three-dimensions.

M5.01 Identify, describe, compare, and classify geometric figures.
M5.02 Visualize and represent geometric figures with special attention to developing spatial sense.
M5.03 Explore transformations of geometric figures.
M5.04 Understand and apply geometric properties and relationships.
M5.05 Classify figures in terms of congruence and similarity and apply these relationships.

TOPIC M6: Explore the concepts of statistics and probability in real world situations.

M6.01 Systematically collect, organize, and describe data.
M6.02 Construct, read, and interpret tables, charts, and graphs.
M6.03 Develop an appreciation for statistical methods as powerful means for decision making.
M6.04 Make predictions that are based on exponential or theoretical probabilities.

M6.05 Develop an appreciation for the pervasive use of probability in the real world.

TOPIC M7: Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

M7.01 Use computers and/or calculators to process information for all mathematical situations.
M7.02 Use problem-solving approaches to investigate and understand mathematical content.
M7.03 Formulate problems from situations within and outside mathematics.
M7.04 Generalize solutions and strategies to new problem situations.

RELATED ACADEMIC TOPICS FOR SCIENCE

S1 Explain the Anatomy and Physiology of the human body.
S2 Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.
S3 Relate the nine major phyla of the kingdom anomaly according to morphology, anatomy, and physiology.
S4 Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.
S5 Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.
S6 Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.
S7 Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance, population genetics, the structure and function of DNA, and current applications of DNA technology.
S8 Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

EXPANDED TOPICS FOR SCIENCE

TOPIC S1: Explain the Anatomy and Physiology of the human body.

S1.01 Recognize common terminology and meanings.
S1.02 Explore the relationship of the cell to more complex systems within the body.

S1.03 Summarize the functional anatomy of all the major body systems.
S1.04 Relate the physiology of the major body systems to its corresponding anatomy.
S1.05 Compare and contrast disease transmission and treatment within each organ system.
S1.06 Explore the usage of medical technology as related to human organs and organ systems.
S1.07 Explain the chemical composition of body tissue.

TOPIC S2: Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.

S2.01 Identify the major types and structures of plants, viruses, monera, algae protista, and fungi.
S2.02 Explain sexual and asexual reproduction.
S2.03 Describe the ecological importance of plants as related to the environment.
S2.04 Analyze the physical chemical and behavioral process of a plant.

TOPIC S3: Relate the nine major phyla of the kingdom anomaly according to morphology, anatomy, and physiology.

S3.01 Explain the morphology, anatomy, and physiology of animals.
S3.02 Describe the characteristics, behaviors, and habitats of selected animals.

TOPIC S4: Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.

S4.01 Examine minerals and their identification, products of the rock cycle, byproducts of weathering, and the effects of erosion.
S4.02 Relate the Hydrologic Cycle to include groundwater its zones, movement, and composition; surface water systems, deposits, and runoff.
S4.03 Consider the effects of weather and climate on the environment.
S4.04 Examine the composition of seawater; wave, tides, and currents; organisms, environment, and production of food; energy, food and mineral resources of the oceans.

TOPIC 5: Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.

S5.01 Examine the science of chemistry to include the nature of matter, symbols, formulas and nomenclature, and chemical equations.

S5.02 Identify chemical reactions including precipitation, acids-bases, and reduction-oxidation.
S5.03 Explore the fundamentals of chemical bonding and principles of equilibrium.
S5.04 Relate the behavior of gases.
S5.05 Investigate the structure, reactions, and uses of organic compounds; and investigate nuclear chemistry and radiochemistry.

TOPIC 6: Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.

S6.01 Examine fundamentals of motion of physical bodies and physical dynamics.
S6.02 Explore the concepts and relationships among work, power, and energy.
S6.03 Explore principles, characteristics, and properties of electricity, magnetism, light energy, thermal energy, and wave energy.
S6.04 Identify principles of modern physics related to nuclear physics.

TOPIC S7: Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance; population genetics, the structure and function of DNA, and current applications of DNA technology.

S7.01 Examine principles, techniques, and patterns of traits and inheritance in organisms.
S7.02 Apply the concept of population genetics to both microbial and multicellular organism.
S7.03 Identify the structure and function of DNA and the uses of DNA technology in science, industry, and society.

TOPIC S8: Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

S8.01 Apply the components of scientific processes and methods in classroom and laboratory investigations.
S8.02 Observe and practice safe procedures in the classroom and laboratory.
S8.03 Demonstrate proper use and care for scientific equipment.
S8.04 Investigate science careers, and advances in technology.
S8.05 Communicate results of scientific investigations in oral, written, and graphic form.

APPENDIX B:

WORKPLACE SKILLS

APPENDIX B
WORKPLACE SKILLS FOR THE 21ST CENTURY

WP1 Allocates resources (time, money, materials and facilities, and human resources).

WP2 Acquires, evaluates, organizes and maintains, and interprets/communicates information, including the use of computers.

WP3 Practices interpersonal skills related to careers including team member participation, teaching other people, serving clients/customers, exercising leadership, negotiation, and working with culturally diverse.

WP4 Applies systems concept including basic understanding, monitoring and correction system performance, and designing and improving systems.

WP5 Selects, applies, and maintains/troubleshoots technology.

WP6 Employs thinking skills including creative thinking, decision making, problem solving, reasoning, and knowing how to learn.

APPENDIX C:

STUDENT COMPETENCY PROFILE

STUDENT COMPETENCY PROFILE FOR AGRISCIENCE I

Student: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Introduction to Agriscience

_____ 1. Describe vocational student organization activities that relate to and support the instructional program.
_____ 2. Compile information on careers in agriscience.
_____ 3. Apply leadership skills needed in agriscience.

Unit 2: Application of the Scientific Method in Agriscience

_____ 1. Identify a problem to be solved.
_____ 2. Apply the scientific method in problem solving.

Unit 3: Human Relations/Leadership/Ffa Activities

_____ 1. Explain FFA organizational activities that promote and recognize achievements in agriscience.
_____ 2. Identify the benefits of FFA participation to an individual and to the agricultural industry.
_____ 3. Explain opportunities for members in the FFA organization.
_____ 4. Develop and present a 3-5 minute speech on an agricultural topic.
_____ 5. Explain the purposes and functions of parliamentary procedure.

Unit 4: Developing a Supervised Agricultural Experience Program (Sae) in Agriscience

_____ 1. Describe the purposes and requirements of the SAE.
_____ 2. Develop a long-range personal plan for the SAE.
_____ 3. Develop a short-range personal plan.
_____ 4. Complete a training agreement for the SAE.
_____ 5. Describe agricultural record keeping for the SAE.
_____ 6. Maintain agricultural records for the SAE.

Unit 5: Agricultural Information Systems

_____ 1. Produce information for use by others and make it available on the Internet.

Unit 6: Animal Science

_____ 1. Explain the roles and functions of major body systems.
_____ 2. Identify major differences in body systems among species.
_____ 3. Explain the nutrients required by animals for normal growth and development.
_____ 4. Identify nutrient sources and functions for animals.
_____ 5. Develop a ration for a specific species and class of animal.
_____ 6. Classify and explain animal diseases.
_____ 7. Explain methods of controlling diseases.
_____ 8. Explain the risks to humans from contagious and non-contagious diseases and parasites.
_____ 9. Explain procedures to apply for a pest applicator's license.

Unit 7: Mechanical

_____ 1. Explain Ohm's law.
_____ 2. Explain magnetism.
_____ 3. Measure temperatures using Celsius, Kelvin, and Fahrenheit scales.
_____ 4. Explain the operating principles of internal combustion temperatures.
_____ 5. Explain principles and applications of fluid power machines.
_____ 6. Use a voltmeter.

Unit 8: Principles of Fiber Science

_____ 1. Identify terms related to fiber science.
_____ 2. Explain the fiber industry in relation to clothing, paper, and textiles.
_____ 3. Explain the economic importance of fiber.
_____ 4. Explain the ginning process for cotton.
_____ 5. Explain the paper making process.

Unit 9: Plant

_____ 1. Explain terms associated with plant science.
_____ 2. Categorize the classes of agricultural plants.
_____ 3. Determine the nutrients needed for proper plant growth.
_____ 4. Describe common plant pests and diseases and control methods.
_____ 5. Compare the activities in a plant during exposure to light and darkness.

_____ 6. Explain the various food storage processes in plants.
_____ 7. Distinguish between sexual and asexual reproduction.
_____ 8. Identify the reproductive parts of flowers and seeds.

Unit 10: Soil Science

_____ 1. Determine soil textures from selected samples.
_____ 2. Explain factors affecting soil classification.
_____ 3. Describe methods used in determining soil capability classes.
_____ 4. Apply procedures for collecting soil samples.

Unit 11: Natural Resources

_____ 1. Explain the importance of forestry in relation to man, wildlife, and water.
_____ 2. Identify properties of wood.
_____ 3. Identify species of trees.
_____ 4. Identify principles of forest management.
_____ 5. Identify the characteristics of selected species of wildlife.
_____ 6. Explain interdependency occurring within the wildlife community.
_____ 7. Conduct contamination analyses.

Unit 12: Entomology

_____ 1. The student will identify the external parts of an insect.
_____ 2. Explain the functions of each major part of an insect.
_____ 3. Collect specimens and classify them according to their characteristics.
_____ 4. Apply an integrated pest management plan in the greenhouse.

Unit 13: Biotechnology

_____ 1. Explain contributions which biotechnology makes to agriculture.
_____ 2. Explain the role of DNA and RNA in living creatures.
_____ 3. Identify methods of transferring genetic information.

Unit 14: Opportunities in Agriscience

_____ 1. Explain terms related to agriscience career opportunities.
_____ 2. Explain the opportunities for agriscience careers.
_____ 3. Identify educational requirements for agribusiness careers.
_____ 4. Set personal goals for career and development.
_____ 5. Prepare for employment interview.

August 1, 1995

STUDENT COMPETENCY PROFILE FOR AGRISCIENCE II

Student: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Communication Skills

_____ 1. Describe steps in preparing an oral presentation.
_____ 2. Apply basic principles of public speaking.
_____ 3. Present a 6 to 8 minute speech on an agriscience topic.

Unit 2: Supervised Agricultural Experience (Sae) In Agriscience

_____ 1. Continue SAE activities. (Ongoing)
_____ 2. Maintain agricultural records for the SAE.

Unit 3: Advanced Biotechnology

_____ 1. Explain terms associated with biotechnology.
_____ 2. Explain the benefits of biotechnology.
_____ 3. Explain concerns about biotechnology.
_____ 4. Explain the environmental impact of biotechnology.
_____ 5. Explain the regulatory control of biotechnology research and industry.
_____ 6. Explain ethical issues impacting biotechnology.
_____ 7. Indicate the companies in the biotechnology industry.
_____ 8. Explain career opportunities in biotechnology.
_____ 9. Apply procedures of tissue culture.

Unit 4: Food Science

_____ 1. Explain nutritional needs of humans and their functions.
_____ 2. Explain the food groups which provide the essential nutritional requirements for human nutrition.
_____ 3. Explain food customs around the world.
_____ 4. Apply processes of making yogurt.

Unit 5: Advanced Plant Science

_____ 1. Define terms associated with hydroponics.
_____ 2. Identify requirements for hydroponics plant production.
_____ 3. Explain types of hydroponics systems.
_____ 4. Apply greenhouse management.
_____ 5. Explain procedures to apply for a restricted pest management permit.

Unit 6: Advanced Soil Science

_____ 1. Explain functions of soil nutrients in plant growth.
_____ 2. Determine soil nutrients present in soil samples.
_____ 3. Perform soil testing and interpret results.
_____ 4. Interpret soil analysis survey.

Unit 7: Environmental Science

_____ 1. Identify major components of air.
_____ 2. Describe the importance of air quality as it relates to humans and other living organisms.
_____ 3. Identify common threats to air quality.
_____ 4. Explain practices to reduce air pollution.
_____ 5. Identify terms related to environmental quality.
_____ 6. Cite important relationships between land characteristics and water quality.
_____ 7. Explain major threats to water quality.
_____ 8. Test local water system for possible contamination.
_____ 9. Plan an experiment to determine the effect of soil water on plant growth.
_____ 10. Design and construct a project to demonstrate concepts of erosion control.

Unit 8: Aquaculture

_____ 1. Explain terms associated with aquaculture.
_____ 2. Explain the aquaculture food chain.
_____ 3. Explain the major aquaculture production systems.
_____ 4. Plan a small-scale aquaculture production system.

Unit 9: Advanced Animal Science

_____ 1. Explain terms related to advanced animal science.
_____ 2. Explain how animal traits are passed on to offspring and which traits are best transferred.

_____ 3. Explain growth promoters for animals.
_____ 4. Explain the need and methods for checking the vital signs.
_____ 5. Explain the need for and processes of artificial insemination in animals.